

# The MILLING WORLD

## and CHRONICLE OF THE GRAIN and FLOUR TRADE.

PUBLISHED EVERY THURSDAY MORNING.

VOL. XI.—NO. 3.

Buffalo, N. Y., November 20, 1884.

\$1.50 Per Year.  
Single Copies, 3 Cts

### ANCIENT AND MODERN FLOUR.

[From Oester.-Ung. Mueller Zeitung.]

WHAT a difference between the so-called "good old times," and the present age? A miller of one hundred years ago never dreamed of the immense progress of milling during the past century. Of course, nobody doubts that even then a few men lived who had some idea about improved methods in order to secure an improved quality of flour; but they had no ways and means to put their theories into practical operation. There were men also who knew that a decided change would take place as soon as the times were far enough advanced to permit the construction of the necessary machinery for milling purposes, and that such a change would bring about an equally decided improvement in the quality of the flour. We can readily admit that such theories existed a hundred years ago, but it seems hardly probable that even the wildest imagination dreamed of the manufacture of flour as carried on to-day.

When we at present form an estimate of future progress, or consider the possibilities of milling, we occupy a position different from that of our forefathers. Our present methods of flour manufacture are no longer crude. We have witnessed, within the past twenty years, a complete revolution in milling, and our present method is very properly called by the Americans "the art of milling." Thanks to this progress, we possess at present a flour that is satisfactory to every consumer. There are many who, when comparing the past with the present milling system, predict a reaction for the future, in view of the rapidity of the progress. This erroneous conclusion is fortified by the assertion that the present milling system is more expensive than the old form, and that consequently the price of the products must be higher. Of course, the expenses incidental to the erection of a modern mill as compared with those of a primitive mill, represent a fortune; that is well known everywhere. The modern mill is not only a receptacle for many forms of machinery, but also an exhibition of scientific principles and mechanical ingenuity, never dreamed of in olden times. As such a mill represents itself to-day, it certainly creates an impression of stability and permanency. The question of expenses does not enter into any calculation of future prospects, in fact all wild speculations and indulgences in dark colored predictions never influence the progress of milling; the only competent factor to decide here, is the product, the flour.

As long as the flour is of superior quality, as long as there is demand for it without asking which mill produced it, or, what is the price of making it, just so long the sale of that flour is ensured when the majority of the population can afford to buy it. If the mill does not pay a dividend commensurate to the capital invested, we cannot blame the flour, but the cause will be found in some unfavorable condition due to general or special circumstances. The population of the district have no objection whatever, if somebody sells his flour at a loss; the purchaser will consider only the quality. If there are too many mills, and the output exceeds the demand, we have an overproduction, and the excess of the production re-acts on the prices with a proportionate reduction. Overproduction can ruin any

industry according to national laws. It is wrong to blame the unfavorable location of the mills, the expensive machinery or the costly mode of manufacture. This erroneous assumption has nevertheless many advocates, and figures are freely quoted in proof of it; many mills are cited where the financial conditions made future working impossible, clearly demonstrating, at least to the satisfaction of those prophets, that the flour of the future will again be like the flour of the past. It is nonsense to build additional mills during a period of overproduction, unless a series of conditions of a peculiar nature combine to defeat any possible competition. Or what can be the possible result, if at the present time, a large mill is built with borrowed money in a locality where the fundamental principles of prosperity are absent? Fine flours are always valuable, but they cannot successfully combat the natural market prices, or remedy the mistakes made in the conception of the mill.

People who adhere to the superstition that the mills of the future will not need as much knowledge and skill as those of the present, will also adhere to rather peculiar views about the flour. Of course nobody, who is acquainted with milling and the milling industry, advocates such views, and yet they prevail extensively among those who either have no opportunity to acquire the necessary knowledge, or who purposely shut their eyes to the progress. The same people will predict a lucrative system of adulteration of the fine grades of flour, since the public taste has become accustomed to products of good quality. There really seems to be no necessity to express such fears. The spirit of progress in milling has not only kept pace with the demands of the public, but has really been the educator, has created the demand. Why should this be reversed in the future? Besides this, mother nature is the successful rival of all imitations and adulterants. So far nothing has been discovered to replace the constituent particles of the grain, or to be its successful imitation. The purer the flour, the more it will be appreciated and the endeavors of the manufacturer in this direction are entirely conformable to the wishes of the consumer.

There really seems to be no good cause for a reaction, and if we admit that any retrograde movement in the production of flour is impossible, a careful review of the situation will convince us that gradual improvements of the present system of milling will be in order for some time to come. The latest change was too rapid altogether to expect a "perfect" system at the present date. Nevertheless, it will be a risky undertaking to predict what kind of a flour we will have within a century. It is withal possible that then the milling of to-day will be classed as "ancient," in the same manner as we now designate the old-fashioned stone milling as a thing of the past; but a recurrence of a revolution like the one witnessed within the past twenty years, is decidedly improbable. It is safe to assume that the present system will be more elaborated and improved in its details as long as any of it is susceptible of improvement. In many mills of to-day the gradual reduction by rollers, the purifying as well as the bolting, is yet in its infancy, and will need a slow improvement to attain nearer to perfection.

Inventive genius and practical knowledge find the field wide open. The practical miller, when running the new system, must acquire the necessary technical knowledge for a successful operation of the mill. A careful selection of the best machinery is yet a long distance removed from its successful operation; there are so many things to be tested, learned, investigated or improved. Mistakes and faults are found which need correcting, and a continued, careful observation will suggest many minute changes and improvements before the total machinery is in successful working order. Is there any reason why the flour of the future should not be of a higher quality than that of the present? There seems to be none, as the development of milling progresses in the right direction, and we are drawing nearer to the final goal of the miller, "the production of a branless flour, and a flourless bran." That will be the product of the future. Mills which work with this aim in view, and are not retarded by lack of capital or other specially unfavorable circumstances, will prosper, even in spite of the present unsatisfactory state of commerce and industry.

### ROLLERS VS. MILLSTONES.

M. Paul Caens makes some lengthy remarks upon this well-worn theme, in the last number of the Journal de la Meunerie, from which the "Miller's Gazette" translates the following: "If really the brilliant results obtained by rollers rest upon solid and sure foundations, as we are led to believe, our millstones are, without doubt, dethroned, never to return; what then is to become of our system of milling, imported from England about 50 years ago, and for which we have to thank Messrs. Darblay, who took the initiative in this new method, and who have worked it without having need to improve the quality of their output? Their profound knowledge of milling and of the commerce of grain with their large financial means, have enabled them to rival, and even surpass our neighbors in England. But, looking at roller milling, may we ask, is it to the rollers alone that we owe the excellence of the products of roller milling? We answer, No; if wheat were treated by rolls exactly as it is by stones, the result would be far from good. It is therefore the system. Nearly every German miller is unacquainted with the science of millstone dressing; therefore they could not equal our low milling, and naturally looked askance on our high grinding by stones, which is without doubt the best known for obtaining the highest results. The Austrian and Hungarian millers manufactured their flour in the following manner, twenty years ago; the wheat, after passing through a vigorous course of cleaning, was first broken down, or cracked, on millstones; after which the product was scalped through wire clothed reels, which separated the dark flour, part of the germ and a portion of the low class middlings. The tailings from this scalping were then treated by stones for the production of middlings, which were also bolted and sized. The third operation consisted in re-grinding the middlings which had not been suitably reduced; the middlings were purified and re-purified several times, and afterwards re-ground according to their size,

and then produced what was known as Hungarian flour. When smooth rolls made their appearance, the Hungarian millers adopted them at once, as they were actually what they wanted for the reduction of middlings. Some years later grooved rolls were put forward, and the German millers who did not understand true stone dressing, as we have remarked above, accepted them blindly, and without trial. This system of Hungarian milling subsequently spread in all countries, Russia, America, &c, and then came a falling off in our exports of flour, and an increase in our imports.

It is quite plain that competition was difficult, if not impossible, even if we adopted the same system of milling; Austria, Hungary and Russia have an entirely different class of consumers of production to us; Russia produces largely of wheat, but two-thirds of her population eat rye bread. Another class, higher up in the social scale, consumes the low class wheaten flour, so that it is easy to understand that the secondary and inferior products of roller milling sold easily at good prices, whilst in France their sale would be difficult even at very low prices. Moreover Russian wheat is more suitable than French for treating by rolls. However we must not remain in status quo; it is necessary that we improve our manufacture as much as possible. Returning to the stones, we must say that we prefer them, and we should not reject them so unconcernedly as the German miller, without seeking more into the question. To sum up—Has the millstone done all that was possible by it? No. Is there still some profitable manner in which it can be used for breaking down wheat? Yes. Therefore we must discover some mode of dress more suitable, and results will soon follow. It will suffice simply to double the number of furrows on a stone, and to depress the stone in such a manner that the old furrows will attain a width of 2 centimetres, by  $3\frac{1}{2}$  to 4 millimetres deep at most, at the eye, and 7 to 8 at the skirt. With some other alterations of the dress wheat can be broken down in a better manner than by grooved rolls, which have much less grinding or breaking surface. Roller mill champions say, truly, that more flour is made in the first break with stones than with rolls. This is quite correct; but as the extra flour made is of very inferior quality it follows that there is all the less of inferior flour to mix subsequently with the fine sorts, so that this constitutes really an advantage over break rolls. It is perfectly well known that stones do not make such fine flour as rolls because they pulverize the bran, whilst rolls only flatten it out; but the more it is tried to show that the millstone is unfavorable for making middlings, the more is proved in its favor; in fact, it is found that the millstone is good for breaking down wheat into middlings but bad for making flour. We may ask the following questions in this connection:

Does the roller detach the bran as well as the millstone? No.

Does the roller dislodge the germ as well as the stones? No.

Will the roller take off the beard of the grain, like the stone? No.

As proved by microscopical examination, will there not be more flour or middlings attached to the bran after breaking down,



on rolls, than after reduction by stones? Yes.

It is in this last-named phase that the porcelain roller mill does immense service, and we should therefore adopt these machines for this purpose, since they work without heating, and better than iron rolls; but we should preserve our stones for making and preparing the middlings. This, then, is the mixed system which we should take as a basis for treating our French wheat.

Low grinding millers, desiring to improve their quality, should adopt this mode of breaking down the wheat, and should treat the product on centrifugals clothed with wire sufficiently fine to allow only the germs, etc., to pass over, and then take out the light bran by means of an aspirator.

### OUR EXPORT FLOUR TRADE.

The almost unprecedented activity of the larger wheat-flour mills throughout the country during the past two or three months, during a period of great depression among almost all manufacturing industries, is sufficient to attract attention, "Bradstreet's" tells us in its last issue. An examination into the development of our export trade in wheat flour reveals details respecting America's first place as a flour maker, which point to the following conclusions: First—That the consumption of bread, in this country at least, has not declined, notwithstanding the relatively high price (as compared with the cost of flour) demanded by bakers. Second—That more American-made flour is going abroad than ever, and at a time, too, when shipments of cotton have been popularly regarded as the only increasing export of a domestic staple. Third—That British millers are unable yet to compete successfully with flour from the United States, notwithstanding their wide range of wheats from which to select a combination for grinding, of which we on this side have heard so much of late; and fourth—That the increasing annual shipments from the United States of wheat as flour bids fair, at the present rate of increase, to reverse the proportions (in value) now held by our wheat and flour shipments abroad. The domestic flour market has long been quoted comparatively quiet, with a fair inquiry for export, mostly for low grades, of which the receipts at seaboard have not been in excess of the export inquiry. Better grades at seaboard have been in larger receipt and lighter demand, and prices have not been so well maintained. On all grades, however, quotations have been low and in the main declining. The following indicates the shrinkage:

	July 1.	1884.	July 1.	Sept 17	Nov 7.
No. 2.....	\$2.60	\$2.60	\$2.25	\$2.00	\$2.30
Winter, patent....	7.00	6.50	5.50	4.75	4.85
Spring, patent...	8.75	7.25	6.00	4.60	4.10

It also points to the ability of our millers to make good flour at a low cost and to sell it cheap, in part due to the outcome of the improved processes of milling introduced here of late years. It is to these, undoubtedly, that the English miller must look for the element of competition which he has thus far failed to overcome. It must not be overlooked, of course, that reduced transportation charges in the United States have facilitated shipments of flour from the interior. Comparatively few aside from those interested and those engaged in allied trades and industries have realized the proportions, to which the export of American flour has grown. To the end that this subject may be brought out clearly, special analyses of reports from the United States (National Bureau of Statistics) and of agricultural returns to the British Parliament have been made.

In the past thirteen years (ending June 30) the production of wheat in the United

States has nearly doubled, the proportion of the crop sent abroad (as wheat) has increased two and three-quarter times, and the share exported as flour has increased three and two-third times. The figures in detail, as per the government reports, are:

Government report	Total crop year ending June 30.	U. S. bush.	Wheat exp'd bushels.	Flour exp'd barrels.
1871-72.....	230,722,000	26,423,000	2,514,000	
1872-73.....	249,997,000	39,204,000	2,562,000	
1873-74.....	281,254,000	71,039,000	4,094,000	
1874-75.....	309,102,000	53,047,000	3,973,000	
1875-76.....	293,136,000	55,073,000	3,985,000	
1876-77.....	89,356,000	40,325,000	3,343,000	
1877-78.....	364,194,000	72,404,000	3,947,000	
1878-79.....	420,122,000	122,355,000	5,629,000	
1879-80.....	448,755,000	153,252,000	6,011,000	
1880-81.....	498,549,000	150,565,000	7,945,000	
1881-82.....	380,280,000	95,271,000	5,915,000	
1882-83.....	504,185,000	106,385,000	9,205,000	
1883-84.....	420,154,000	70,349,000	9,152,000	

Percentages of Growth.	Crop inc. or dec. per cent.	exp'd wheat flour.	P. c. crop wheat and flour.	P. c. crop exp'd wheat flour.
1870-71.....	Inc. 8.1	17.1	11.4	5.7
1872-73.....	Inc. 12.3	32.6	25.2	7.4
1873-74.....	Inc. 9.9	23.6	17.1	6.5
1874-75.....	Dec. 5.1	25.9	18.7	7.2
1875-76.....	Dec. 1.3	19.8	13.9	5.9
1876-77.....	Inc. 25.9	25.5	19.4	6.1
1877-78.....	Inc. 14.8	35.4	29.1	6.3
1878-79.....	Inc. 6.6	40.2	34.2	6.0
1880-81.....	Inc. 11.1	37.3	30.2	7.1
1881-82.....	Dec. 23.6	32.1	25.0	7.1
1882-83.....	Inc. 32.6	29.4	21.0	8.4
1883-84.....	Dec. 16.6	26.5	16.7	9.8

In the past season the increase of crop yield was 19 per cent.

The percentages which we have calculated show that the average annual proportion of the domestic wheat crop exported (both wheat and flour) between 1872 and 1874, years ending June 30 (three years), was 23.5 per cent., against an annual average of 23.7 per cent. exported in the four years ended June 30, 1878, and as compared with 33.5 per cent. exported in the six years ended June 30 last. The proportion which went abroad as wheat only in the periods named were respectively 17.4 per cent., 17.5 per cent. and 26.03 per cent. The shipments of flour annually averaged, during the three years first named, 6.03 per cent. of the entire crop of wheat; during the second period (of four years) 6.42 per cent., and during the past six years 7.45 per cent. In the year ended June 30 last we sent abroad 26½ per cent. of the wheat raised, of which nearly two-fifths had been reduced to flour. In other words, one-sixth of the entire wheat crop was sent abroad as wheat, and nearly one-tenth in the form of flour. Thirteen years before a little over 10 per cent. of the wheat grown (1871-72) was shipped abroad in the form of wheat, and less than 6 per cent. as flour; the proportion of the crop exported as wheat has therefore increased one-half in thirteen years, while that which has gone abroad as flour has nearly doubled. The shipments of flour from this country have increased in value more rapidly than those of any other single leading product shipped. This is shown by the fact that it has risen from sixth place in 1873-74 (ending June 30) to fifth place (in value) in 1882, and to third place in 1882-83. The approximate values of the eight leading exports from the United States in those years were:

#### EXPORTED FROM THE UNITED STATES.

	Years ending June 30—	1882-83.	1881-82.	1874.
Cotton.....	\$247,000,000	\$199,000,000	\$211,000,000	
Wheat.....	119,000,000	112,000,000	96,000,000	
Flour.....	54,000,000	36,000,000	25,000,000	
Refined oil.....	40,000,000	47,000,000	39,000,000	
Bacon and hams	38,000,000	46,000,000	38,000,000	
Indian corn.....	27,000,000	28,000,000	24,000,000	
Lard.....	26,000,000	28,000,000	19,000,000	
Tobacco.....	22,000,000	21,000,000	32,000,000	

The direction in which our exports of wheat flour go now becomes of special interest. Beyond the fact that the demand from the United Kingdom and Ireland is the largest, and that Central and South America are also large takers, popular information is meager. The following percentage of our total exports to the countries

named (approximate) have been specially prepared:

Exports of Flour from United States	Year ending June 30—	1882-83.	1878-79.	1871-72.
	Barrels.	Barrels.	Barrels.	Barrels.
Distributed to:	Per ct.	Per ct.	Per ct.	Per ct.
United Kingdom.....	62.0	47.0	13.0	
Brazil.....	8.0	12.5	15.0	
British W. Ind. & British S. Am.	5.6	9.8	14.9	
British N. Am. (excl. Canada)	3.5	6.3	7.7	
Canada.....	2.8	2.5	13.3	
Cuba.....	2.6	2.2	6.5	
Hayti and San Domingo.....	1.4	2.5	2.9	
Belgium.....	1.3	0.8	0.16	
Porto Rico.....	0.8	0.85	2.7	
France.....	0.7	0.5	Nom.	
Germany.....	0.3	0.2	0.12	
Other countries.....	11.0	14.9	23.00	

While the takings of flour by the West Indies and of Central and South America are thus seen to be considerable, those by the United Kingdom, aggregating over 64 per cent. in the year ending August 31, 1884, nearly two-thirds of the whole are of sufficient prominence to call for a special review of its production and receipts of wheat (both as wheat and flour). The figures as returned to Parliament for the periods noted were:

—000's omitted—	Total crop U. K.	British quarters	Wheat	Flour	Per cent. inc. or dec.	Per cent. inc. or dec.
1871-72	10,056	39,407	4,396	Inc. 16.0	Inc. 54.0	
1872-73	10,558	45,989	6,551	Dec. 6.2		
1873-74	10,322	43,167	6,430	Dec. 6.2		
1874-75	14,344	43,344	5,663	Inc. 25.3	Inc. 7.1	
1875-76	9,883	54,226	6,036	Dec. 16.3	Inc. 10.9	
1876-77	10,544	45,442	6,681	Inc. 19.8	Inc. 19.0	
1877-78	9,763	54,101	8,040	Dec. 6.4	Inc. 10.2	
1878-79	11,413	50,681	8,865	Inc. 17.8	Inc. 19.3	
1879-80	6,685	59,533	10,443	Dec. 3.5	Inc. 20.0	
1880-81	7,563	57,408	12,487	Inc. 6.3	Dec. 11.5	
1881-82	8,723	61,096	11,095	Inc. 49.1		
1882-83	10,687	69,276	16,477	Dec. 8.7		
1883-84	10,296	55,237	15,012			

While the British imports of wheat have increased 36 per cent. since 1871-72, those of flour have more than trebled. The leading countries supplying the United Kingdom with flour and the quantities sent there for thirteen years past have been:

#### BRITISH IMPORTS FLOUR (SUPPLY SOURCES)—000's OMITTED.

	Cal- endar years.	From U. S.	From Ger- many.	From P. ct. from U. S.	From P. ct. from Ger- many.	From P. ct. from U. S.	From P. ct. from Ger- many.	Total*
1872.....	731	17	1,034	321	337	1,367	4,888	
1873.....	1,582	26	691	239	443	1,671	6,214	
1874.....	3,292	53	759	226	389	659	6,236	
1875.....	2,279	36	800	321	337	1,820	6,136	
1876.....	2,320	39	930	445	283	1,089	5,959	
1877.....	1,765	25	1,239	1,034	250	1,901	7,377	
1878.....	3,621	46	1,114	1,348	302	699	7,828	
1879.....	6,962	65	915	1,513	457	355	10,738	
1880.....	6,873	66	977	9,123	524	279	10,558	
1881.....	7,693	68	1,387	12,097	259	203	11,357	
1882.....	7,800	60	1,987	15,567	341	220	13,057	
1883.....	11,270	70	1,928	13,738	503	163	16,329	
1884.....	10,235	68	1,765	12			15,012	

\*Including other countries.

The imports of flour into the United Kingdom during the year 1883 show that of the total quantity received (16,379,317 cwt.) 11,270,918 cwt. were from the United States, or about 69 per cent., as against 59 per cent. in 1882 (when the total was 13,057,403 cwt.) and 68 per cent. in 1881 (when the total was 11,357,386 cwt.) Germany sent 1,928,769 cwt. to the United Kingdom in 1883, or 13 per cent., against 15 per cent. of the whole in 1882 and 12 per cent. in 1881. British North America ranked third in supplying the United Kingdom with flour in the years named, sending 2 per cent. in 1883, 3 per cent. in 1882 and 2 per cent. in 1881. France came fourth, with 1 per cent. in 1883, 1.7 per cent. in 1882 and 1.8 per cent. in 1881. "Other countries" sent 15 per cent. in 1883, 20.7 per cent. in 1882 and 16 per cent. in 1881.

In the first nine months of 1884 the imports of flour by the United Kingdom have been 11,961,374 cwt. as compared with 12,245,412 cwt. in a like portion of 1883, and with 8,918,713 cwt. in nine months of 1882. Of the total received from January 1 to September 30, 1884, 68 per cent. was from the United States, 11.8 per cent. from Germany, 10.9 per cent. from Australia, 4.2 per cent. from British North America, 1 per cent. from France and but 4.4 per cent. (or 504,948 cwt.) from "other countries."

These percentages, with comparisons, for the years previously noted are as follows:

	BRITISH IMPORTS OF FLOURS.	Calender year—9 mos.	1881.	1882.	1883.	1884.
United States.....	68	59	69	68		
Germany.....	12	15	12	11.5		
Australia.....				10.9		
British North America.....	2	3	2	4.2		
France.....	1.8	1.7	1	1		
Other countries.....	16	20.7	15	4.4		

Illustrative of the competition in supplying wheat to millers of the United Kingdom the following specially prepared figures are of value:

	TOTAL BRITISH IMPORTS WHEAT.	P. ct. from U. S.	P. ct. from Russia.	P. ct. from Germany.
1872.....	42,127,726	21.0	42.4	9.24
1873.....	43,863,098	45.1	21.8	9.91
1874.....	41,527,638	55.6	13.8	7.38
1875.....	51,876,517	45.3	19.3	10.8
1876.....	44,454,657	43.4	19.8	5.22
1877.....	54,269,800	39.3	20.0	10.1
1878.....	49,906,484	58.2	18.1	10.3
1879.....	59,591,795	60.6	13.4	6.09
1880.....	55,263,934	65.4	5.22	1.91
1881.....	56,647,903	63.0	7.04	2.38
1882.....	62,503,134	54.6	14.9	4.85
1883.....	69,276,992	47.6	16.9	
1884.....	55,237,868	41.6	14.5	

The proportion received from British India in 1882 was 15.5 per cent., in 1883 12.2 per cent., and in 1884 17.2 per cent.

### UTILIZING STALE BREAD.

The persistence shown by the Parisian bakers in keeping up the price of bread, notwithstanding the great fall in the price of flour has drawn attention to the confraternity and brought out some odd facts in connection with the trade. In addition to the bakers proper there are, it seems, a number of second-hand bakers in Paris who trade in the broken scraps which daily accumulate in all large establishments—such as hotels and colleges—where bread is consumed on a great scale. This refuse is bought by weight, the best bits are picked out and sold to the cheap restaurants, which turn them to account in various ways. The bread soup and other culinary concoctions on which customers are regaled in the cheap restaurants, where a dinner of courses is to be had for 20 cents, are indebted for a portion of their ingredients to this source of supply. The similar and less profitable morsels are baked a second time and ground in a mortar. The powder is then sold to the pork butchers, who use it to garnish the surface of the hams and cutlets which present such an appetizing appearance in their shop windows.

### MEXICO AS A GRAIN EXPORTER.

Our Washington correspondent, says the New York Commercial Bulletin, develops a new cause of or pretext for opposition to the Mexican Reciprocity Treaty; and if the friends of the measure—which include nearly all the Commercial Exchanges and trade organizations in the country—do not exert themselves on its behalf, the chances are that the necessary legislation which is still needed to perfect it will not be forthcoming.

But what is the new development? Briefly this: that a syndicate of capitalists has been formed for the importation on an extensive scale into Mexico of large numbers of coolies, who are to be employed in sugar and tobacco culture at wages so low that it will be utterly impossible for the cultivators of those products in the United States to compete with them, as the Mexicans under the treaty are to have free access to the American market. In a word, it is the old question of Chinese cheap labor in a new place, and the old alarm about the ruin of Southern planters in consequence of a prospective superabundance of low-priced sugar and tobacco. As to the alleged syndicate, it has been hinted at in various quarters in vague terms before, but we have been unable to track it to any reliable source, or, for that matter, to obtain any data whatsoever respecting it which would justify the as-



sumption of the opponents of the treaty that the sister Republic is about to be overrun with coolie labor, to keep out the products of which it is a matter of life and death with us in the United States. If we have failed to unearth anything like this, however, in the course of our investigations, we have discovered the outlines of a colossal European syndicate of another kind—not for the cultivation of sugar and tobacco, but of wheat and corn, for the growth of which the soil and climate of Mexico no intelligent reader needs to be informed are as well adapted as the most favored regions of our own country; the only thing needed for the development of the industry being liberal capital, a plentiful supply of labor and increased transportation facilities, all of which these European business men propose to provide. The syndicate, it would appear, is composed of a number of wealthy distillers in France, Holland and Belgium, who consume in their business operations annually some 3,000,000 tons of this grain, and who are desirous of procuring in future a sure supply of corn every year at a fixed price, at the same time that they will be freed from the necessity of depending upon "the mercy of American speculators." In order to carry out their project, they have commissioned their agent, Count Langrand, to place himself in communication with the Mexican National Railway Company with these definitive propositions;

1st. To complete the construction of certain great Mexican railway lines which connect with the ports of embarkation.

2d. To assist in the construction of branches to open up districts favorable for the production of corn.

3d. To foster the development of corn cultivation by making arrangements with all the landed proprietors who have land in cultivation and possess other uncultivated property, who may be disposed to raise corn simply for exportation. Said manufacturers will buy in advance, at a conventional price and for a long term of years, the production of these now uncultivated lands.

As to the resources of Mexico as a producer of cereals, and her ability to respond to these propositions, there can be no question. In 1881, according to official statistics, it produced 5,400,000 tons of corn, and the syndicate are persuaded, from the best information they can get, that if all the lands there adapted to the cultivation of corn were fully utilized they would turn out at least three times more than are produced to day by lands which are now used to supply the local necessities of the inhabitants, horses, mules, swine, etc., etc.; so that the country could easily export to Europe some ten million tons under conditions very advantageous to the farmers as well as to the railroads of Mexico. The Mexican Financier, to which we are indebted for an authoritative exposition of the plans of the European syndicate, has no doubt the scheme will be put in execution as soon as contracts are signed by a sufficient number of land-holders to guarantee a total delivery of not less than 1,500,000 tons of corn, and a maximum of 3,000,000 tons which the Company will buy of them every year on the spot at the stipulated price and which it will take upon itself to export. These manufacturers, as already intimated, are not speculators in grain, but find their assurances of profit in the certainty of being able to buy at a fixed price great quantities of corn for consumption in their industry for the period of thirty years, and thus protect themselves from the fluctuations of the market.

We are disposed to think that this is the only European syndicate which the opponents of the Reciprocity Treaty have heard of, and by virtue of which they expect to defeat it. But as neither the cultivation of sugar and tobacco nor the whole-

sale importation of coolie labor is within the sphere of its contemplated operations (these things not being alluded to even), they evidently expect to impose upon the intelligence of Congress and the country by restarting the hobgoblin of Chinese cheap labor where nothing of the kind is contemplated. If any class of our people have reason to be uneasy about it, it is not the sugar and tobacco growers of Louisiana, Virginia and Kentucky, but the farmers of the grain states in the northwest, who are thus threatened with competition in the European markets from a new and unexpected quarter.

#### WHEAT GROWING IN NEW ZEALAND.

A correspondent of the "Miller" writes: In colonizing a new country the land near the sea coast is, as a matter of course, the first occupied. In the absence of roads, and with but little knowledge of the aboriginal natives, their character, or their language, any journey of more than a few miles from the port at which the immigrant arrives is out of the question. This was most apparent in the part first colonized in New Zealand, for less than a day's journey brought the colonist to the foot of mountains two or three thousand feet in height, and from the summit of these appeared other and higher mountains in apparently interminable succession. Thus to cultivate or occupy a fringe of sea coast from ten to fifty miles wide seemed the utmost that was practicable. Stimulated, however, by the hope of success, and by that innate love of adventure that has made the Anglo-Saxon the pioneer of civilization, enterprising colonists ascended the mountains, penetrated the dense woods, and the results of their courage and energy are to be seen in the smiling fields, the bounteous harvests, and the numberless flocks and herds now visible on every side.

Scattered over both islands are the homesteads of these early settlers. The traveler leaves the town and rides twenty or thirty miles through the lonely hills, till, his day's journey nearly done, he sees in the distance a pleasantly situated mansion, surrounded by its garden and grounds; and if provided with a letter of introduction, even from a friend's friend, he is sure of abundant hospitality and kindness. In the evening chat confidences are exchanged, and the visitor congratulates his host that the lines have fallen to him in such pleasant places, and on the evident prosperity surrounding him. Possibly his host says that he came there, some thirty years ago, possessed of very few pounds, and that he camped the first night under the stars. The success is very apparent; not so apparent are the toils and dangers undergone in obtaining it. Perhaps his host adds, "I was one of a party of four who started to explore this district in 1850; one of us was disheartened at the difficulties and returned home; one died from the hardships and we buried him on the hillside; another was drowned while crossing a river, and I alone am left to tell the story." Under such circumstances it is not a matter of surprise that settlers should regard their landed possessions with more than ordinary feelings of attachment, and be extremely unwilling to part with the proprietorship; and thus the existence of landed estates too large to be worked profitably except as pastoral properties form a considerable difficulty in the development of the colony, and to the settlement of agriculturists who would be interested in wheat cultivation. The low price of wool, which had caused wheat growing to be held in more favor, has of late been more than compensated by the success of the process for refrigerating and transporting sheep; and though the area devoted to wheat will doubtless increase year by year, progress by leaps and bounds must not be

expected. From some hitherto unexplained cause the English grasses are not permanent in New Zealand, but die or become worthless in five or six years; wheat is the crop by which they are usually succeeded, after which the land is laid down in grass again. For the purpose of growing this wheat, the large landed proprietors let their land in blocks of 500 to 1,000 acres to the so-called "croppers."

The value of wheat in New Zealand is regulated by the price in the London market; thus, if wheat is worth 50s. per qr. in London, and it costs 16s. per qr. to send it there, it will be worth 34s. per qr. in New Zealand. If a higher range of prices was obtained for any length of time, a much larger area of land would be brought under cultivation; but land carriage is so expensive that it does not pay to grow wheat, even on the most fertile soils, at a greater distance than fifty miles from a railway station. Although New Zealand is abundantly watered, its streams are rather mountain torrents than navigable rivers, and the fifty miles of carriage by land to rail or seaport costs as much as the voyage of 15,000 miles to the United Kingdom. A spirited public works policy has long been the practice of the Colonial Government, and as the railways belong to the colony (not as in England to companies), grain is carried at the lowest remunerative rate. Railways are being taken in every direction, not only where population exists, but also into districts where, from the fertility of the soil or other natural advantages, settlers are likely to be attracted. Wheat will grow freely in the South Island from the sea coast to 1,600 feet above the level of the sea, and probably not a tenth part of the land adapted for wheat is used for its cultivation, but with the increase of the population, the development of the railway system, and the sub-division of the large landed estates, wheat growing will become still more largely than at present one of the most important industries of the colony.

The cost of wheat growing varies from many causes, but the following statement, which is from facts within my knowledge, may be taken as a reliable estimate. The produce, 32 bushels per acre, is slightly beyond the average, but the mode of tillage was unusually expensive, so that the net result is not affected:

Tillage per acre, by contract.....	£0 16 8
Seed per acre.....	0 10 0
Harvesting per acre, by contract.....	0 18 0
Threshing per acre, by contract.....	0 10 8
Rail and cartage of grain to seaport.....	0 8 0
Interest, 7½ per cent. on cost of land.....	0 12 9
Taxes per acre.....	0 0 9
	£3 16 5

Total cost of 32 bushels of wheat at shipping port = 2s. 5d. per bushel.

#### A HARDWARE STO'.

At the restaurant at Pensacola Junction: Last spring while I was on my way to the "Mardi Gras" we stopped there for dinner. A gentleman desired to take a cup of tea into the train for a sick lady. "No!" yelled the proprietor, "you can't take no cups out o' yere."

"But it is for a lady who is to ill to come in."

"Don't make no difference," was the reply; "no cups kin go out o' yere."

"I'll pay you for one," persisted the gentleman, producing a dollar bill.

"We don't sell cups," was the sneering answer. "D'ye think we keep a hardware sto'?"

"Judging from this," said the man who balanced one of the doughy sandwiches in his hand and looked at it critically, "I should suppose you did!"

The passengers set up a mighty shout of laughter and approval, but nevertheless the man did not get off with the cup of tea and the invalid lady's thirst remained unquenched.—Balt. South. Manufacturer.

## SPECIAL ADVERTISEMENTS.

*Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1½ cents per word for one insertion, or 4 cents per word for four insertions. No order taken for less than 50 cents for one insertion, or \$1 for four insertions. Cash must accompany the order. When replies are ordered sent care of this office, 10 cents must be added to pay postage.*

#### A CHANCE.

A reasonably sure method of making money. Weekly paper free to investors. E. H. MASON, 285 S. Jefferson street, Chicago, Ill. 274

#### FOR SALE OR RENT.

A three run water mill in running order. Good machinery. Well located for merchant or custom work. Address, JANE POPE, Cortland, N. Y. 36

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Water power. On railroad track. First-class order. Good wheat country. For information address, NATIONAL STATE BANK, Boulder, Col. 262

#### A BARGAIN.

One 16-inch under-runner, full iron frame, middlings mill, made by C. C. Phillips, Philadelphia. It is brand new, has never been used, and will be sold at a big bargain as I have now no use for it. Address C. 91, care THE MILLING WORLD, Buffalo, N. Y. tf

#### YOU CAN BUY THESE CHEAP.

Three McCully Corn Cob Crushers. The above articles are brand new, in perfect condition, just as they left the factories, and will be sold very cheap for cash. Address S. 30, care THE MILLING WORLD, Buffalo, N. Y. tf

#### CUSTOM MILL FOR SALE.

A mill in a good neighborhood, for all kinds of custom work, consisting of five burrs, upright and circular saws, with other machinery, all in good order, turned by two overshot and one turbine wheels. Terms easy. Apply to C. W. DOWNEY, Administrator, Taylortown, Loudoun county, Va. 36

#### FOR SALE CHEAP.

One 6-horse power engine and 10-horse power boiler, all complete, price, \$350; one 8-horse power engine and 10-horse power boiler, price, \$375; one 10-horse power Portable complete, price, \$350; one 10-horse power Russell Traction, price, \$500; one 4-horse power vertical engine, price, \$120. Call or address for particulars EZRA F. LANDIS, Lancaster, Pa. 262

#### FOR SALE.

A four-run New Process water power flouring mill, and 160 acres of very choice land; 40 acres of young timber. Situated in Colfax county, Neb. Mill in good repair. A never-failing water power. All facilities for making first class flour. A good chance to do a first-class paying business. Owners desire to go into other business. This property will be sold at half its cost. Address, J. A. GRIMISON, Schuyler, Colfax county, Neb. 17tf

## SITUATIONS WANTED.

*Advertisements under this head, 25 cents each insertion for 25 words, and 1½ cents for each additional word. Cash with order. Three consecutive insertions will be given for the price of two.*

#### WANTED IMMEDIATELY.

By a young married miller of seven year's experience in custom work. A situation as miller in some good mill. Am used to water and steam. Prefer Central New York. Address, A. L. WHEELER, Canastota, N. Y. 35



#### HOW DOES THIS SUIT?

"Cooch's Bridge, Del., Aug. 25, '84.

"Messrs. Kreider, Campbell & Co., Philadelphia, Pa.

"Gentlemen: Your machine was sent here against an —, on condition that we should keep the best, and we tried each machine, and are frank to say that if your machine cost us \$500 and the other was offered us as a present we should take yours, as we cannot find a fault with it. The above machine has a capacity of 50 bushels per hour."

We think best not to publish name, but it will be given upon application. Address, KREIDER, CAMPBELL & CO. Philadelphia, Pa.

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Do not order your cloth until you have conferred with us. It will pay you, both in point of quality and price. We are prepared with special facilities for this work. Write us before you order.

CASE MANUFACTURING CO.,

Columbus, Ohio.

Office and Factory, 5th Street, north of Naughten.





PUBLISHED EVERY THURSDAY BY  
**THE AMERICAN INDUSTRY PRESS**  
 (LIMITED.)

OFFICES, LEWIS BLOCK, SWAN STREET,  
 BUFFALO, N. Y.

G. B. DOUGLAS, - - Managing Editor.  
 THOS. McFAUL, - - General Agent.

#### SUBSCRIPTION.

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; can be remitted by Postal order, registered letter, or New York Exchange. If currency is enclosed in unregistered letter, it must be at sender's risk.

To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.

Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

#### ADVERTISING.

Card of Rates sent promptly on application. Orders for new advertisements should reach this office on Tuesday morning, to insure insertion in the week's issue. Changes for current advertisements should be sent so as to reach this office Saturdays.

#### EDITOR'S ANNOUNCEMENT.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with any manufacturing or mill furnishing business. Its editorial opinions cannot and will not be influenced by a bestowal or refusal of patronage. It has nothing for sale, but its space to advertisers and itself to subscribers.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

#### MILLERS' ASSOCIATIONS.

NATIONAL.....S. H. Seamans, Sec'y., Milwaukee, Wis.  
 CALIFORNIA.....F. J. Parsons, Sec'y., Oakland.  
 ILLINOIS.....C. H. Seybt, Sec'y., Highland.  
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#### OUR CLUBBING LIST.

**NOTE**—You can save money by availing yourself of the following offers. You can please every member of your family by accepting one or more of the following offers. To save money, and at the same time make the family happy, ought to be the main object of every married man's life. See how you can do this.

#### Take these for Yourself.

THE MILLING WORLD, per year.....\$1.50  
 WITH  
 The Builder and Woodworker.....(\$1.00 per year) 2.00  
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 Mechanical Engineer.....( 2.00 " ) 3.00  
 American Agriculturist.....( 1.50 " ) 2.50  
 The Country Gentleman.....( 2.50 " ) 3.50

#### Take these for your Family.

THE MILLING WORLD, per year.....\$1.50  
 WITH  
 Harper's Magazine.....(\$4.00 per year) 4.50  
 Harper's Weekly.....( 4.00 " ) 4.70  
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 The Century.....( 4.00 " ) 4.50  
 Frank Leslie's Illus. Newspaper.....( 4.00 " ) 4.50  
 Frank Leslie's Popular Monthly.....( 2.50 " ) 3.50

#### Take these for your Children.

THE MILLING WORLD, per year.....\$1.50  
 WITH  
 St. Nicholas.....(\$3.00 per year) 4.00  
 Harper's Young People.....( 2.00 " ) 3.00

ACCORDING to a recent ruling of the New York Produce Exchange no certificates of No. 2 red wheat shall be marked with the words "new crop" after November 30.

INSURANCE companies appear to take a more decided stand in Europe in favor of incandescent electric lamps, than they do on this side of the Atlantic. We are told that the insurance companies of Antwerp have refused to take any risks on the buildings of the forthcoming international exhibition if they are to be lighted by gas. The question is how much would such an action by our insurance companies affect the fire losses?

It has been a hope fondly cherished by some well-known electricians, that the elec-

tric light at night would exercise a similar action upon vegetation as the sunlight does during the day. Extensive experiments have been made to determine this, but, although wonderful things have at times been reported about this forced plant growth, the actual results have been smaller than was anticipated. That the electric light does force the growth of vegetation is admitted, but the benefit derived is altogether out of proportion to the expenses.

MANY of our readers will remember that during the late presidential campaign the war-cry of the Democratic party was "Cleveland and Reform." We note, with exceeding pleasure, that the announcement of Cleveland's election has been followed by reform in at least one direction, viz: the price of matches. Heretofore we have been compelled to accept four boxes for a quarter, but this morning, without any attempt to beat down the capitalist who makes weekly visits to our sanctum to secure our valued patronage, we obtained six boxes, all good, for a quarter. If this is the result of Democratic success at the polls give us more of it. If Democratic success increases by one half the purchasing power of our few shekels, long live Democracy say we. We will be content now if liver retrogrades in price.

THE "Triple thermic motor," the new engine, noted in this column some time ago, which was set into the world with such a great flourish of trumpets and destined to revolutionize the prevailing ideas on motive power, has most ingloriously come to grief in New York. In spite of the announced \$25,000,000 capital stock of the company, the engine on exhibition in New York has been seized, and a suit has been commenced to test the title of the patents. Competent engineers and machinists had, from the beginning, prophesied such an end to the scheme, and their predictions seem to be fulfilled now. It is to be hoped that the number of ignorant or indifferent people, who allowed themselves to be drawn into this scheme by investing their good money in this useless stock, is small or composed of people who can afford to lose the money.

THE price of bread is being extensively discussed by the European press, and Austrian, German, English and French papers are quite unanimous in their decision that, with the present flour prices, bread is altogether too high. Here in America, the people are less dependent upon bakers, because the majority can do, and many do, their own baking at home, owing to the superiority of American cooking stoves. In Europe the number of people who can bake their own bread is limited, and by far the largest majority are obliged to rely upon the bakers. Consequently, as long as they do not suffer by competition among themselves, the European bakers can almost dictate their terms, newspaper discussions notwithstanding, for those who want bread will come anyway. And in the maintenance of their prices the bakers seem to agree almost unanimously. So the municipal government of Paris, which had recommended officially a reduction of the price of bread, received a negative answer from the bakers, who stated that there were so many now who desired to earn their living from baking bread, that it was impossible to reduce the prices. It is plain that the bakers of Paris do not believe in the "survival" of the fittest; if they claim that everybody should be obliged to pay a high price to afford a living to bakers.

A FEW more years like the present will undoubtedly settle the question of lake navigation and decide what vessels are to be used and what kind of power is the most profitable to employ for the transportation

of the immense quantities of freight shipped between the different lake ports. Already we know that smaller vessels, steam as well as sail, are useless and unprofitable property and the tendency towards large steamers, running either alone or with a tow of large barges, becomes more and more apparent. The expenses incidental to the management of large vessels as compared with those of smaller ones are very much less in proportion, and in our present times of close competition between lakes and railroads, the strictest economy is necessary. The future lake marine will largely consist of vessels of 80,000 to 100,000 bushels carrying capacity, and the smaller vessels will become a rarity at a faster rate, as the number of these fresh water monster ships multiply. The small number of steamships of this class which now navigate our lakes have demonstrated that for capacity, speed and low running expenses, they form the safest investment of capital in lake navigation.

LABORATORY experiments are only too often decried as useless and unreliable, because they cannot be carried on under similar conditions on a large scale, and there is undoubtedly some truth in this. If, however, we want to determine anything to such a nicety as to be beyond contradiction, we must resort to laboratory experiments, because there we have a full control of all those conditions which may prove advantageous or injurious to the final results. In this respect the bread-making tests, carried out by Prof. Richardson, of the Agricultural Department, and published on another page, are of interest and worthy of a careful perusal, because the results are rather contradictory to the popular opinion. We are generally led to believe that the quantity of gluten in the flour is the all-important factor in the quantity of the resulting bread. The results of the tests made with eighteen different flours of uniform moisture varied within so narrow limits in the quantity of bread produced, that it was difficult to say which flour gave the largest yield. Although the largest yield of bread was obtained from Minnesota flour, richest in gluten, and the smallest from Oregon flour, poorest in gluten, the difference in the weight of bread amounted to only 7.2 per cent., while the quantity of dry gluten differed as much as 7.31 per cent. The conclusion arrived at by Prof. Richardson is that the quantity of bread obtained from a certain quantity of flour depends more upon the physical conditions of bread-making and the dryness of the flour than upon the percentage of gluten which it contains.

IF there is no money in the making of flour now when will there be? People must eat, and we do not learn that the consumer pays very much less than some months ago, while wheat is abnormally cheap. Did it ever strike you that, as a class, millers are very like farmers? Their mills may run night and day, yet few will admit that there is any money in so doing. Perhaps, however, the miller is content to run at a loss, but somebody is making money out of flour. Who is it? Does this little extract throw any light upon the matter? We take it from the St. Louis Globe-Democrat: "The demand for flour which has sprung up since the election, is said to be partly speculative. One large cracker house is buying large quantities and placing it in store, and several parties are making inquiries for straight lots of 1,000 barrels, purely for speculation. 'Every miller in St. Louis is losing money,' said one of them yesterday. 'One prominent miller said to me yesterday that he hoped he was keeping within expenses, but he could not possibly figure out any profit. I have bought flour on the floor in which I can figure out 15 cents loss to the manufacturer. Either wheat must go lower or flour

higher.' It is evident that there is more confidence in an advance in flour than a decline in wheat, since flour is being stored for speculative purposes."

AN Austrian milling paper gives the following reasons for the alleged superiority of the Austrian high-milling system over the American and English methods. The faster the purification of the middlings is carried out, the smaller is the danger of injury to the finer products by the poorer particles, or the danger of a grinding up of such portion which are to be kept intact. If, for instance, well purified middlings are transported by means of a conveyer for a distance of say 25 feet, we will find that at the end of that distance, these middlings contain from 15 to 25 per cent. of flour. In this case we can see the damage done and guard against it; but there are cases where this can not be done, because the damage is hidden from sight in the endless system of bolting, conveying and elevating appliances. The question is: Will a flour which is uselessly carried about, receive a similar injury? We must answer this question in the affirmative, and this is a serious drawback to the American automatic milling system, because the distance which the various products have to travel is lengthened immensely. How different from this is the treatment of the milling product in the Austrian high milling systems, where the indispensable distance from one machine to the other is traversed by a conveyance of the product in tubs, entirely avoiding any possible friction. What is advantageous in the cleaning of the grain, that is, rubbing of the particles against each other by means of which the dirt is loosened, is injurious to middlings if subjected to a similar treatment. In view of this it does appear that the more extended use of manual labor in the Austrian and Hungarian mills as compared with that employed in the American and English mills, is not so useless an expenditure, as many are made to believe.

WHEN the legislators who are supposed to regulate and audit the expenses of Uncle Sam's household, come to pass judgment upon items of many millions for river and harbor improvements, of which large sums are unnecessary, and go into the pockets of some faithful contractor, or many other millions for a rotten navy, or some similar item which offers an opportunity to someone to add to his bank account, there is very little, if any, serious opposition. If however, such smaller items are encountered as the United States Surveys, the Fish Commission, the Agricultural Department, etc., then economy is practised to the greatest possible extent, and the necessary appropriations are cut down to the lowest figure, for Uncle Sam cannot afford to pay too much for the proper maintenance of these departments. Of course in appropriations where every cent is spent for the most useful purpose, and where no drones and political parasites are tolerated, politicians and legislators take no interest whatever, because such work is beyond the comprehension of the majority of the law-makers, and such things have to be voted down entirely, or at least curtailed as much as possible. A comparison of the sum expended annually by the different countries in the aid of agriculture and the care of the public lands, illustrates the foregoing very forcibly. Russia appropriates annually \$15,000,000 for that purpose; Austria-Hungary, \$5,500,000; Great Britain, \$800,000; and the little kingdom of Sweden even spends \$65,000 per year for its agricultural development, while the rich United States give about \$50,000 for the same purpose, and even that is often appropriated grudgingly, and additions to this sum which would enlarge the usefulness of the department, are generally voted down.



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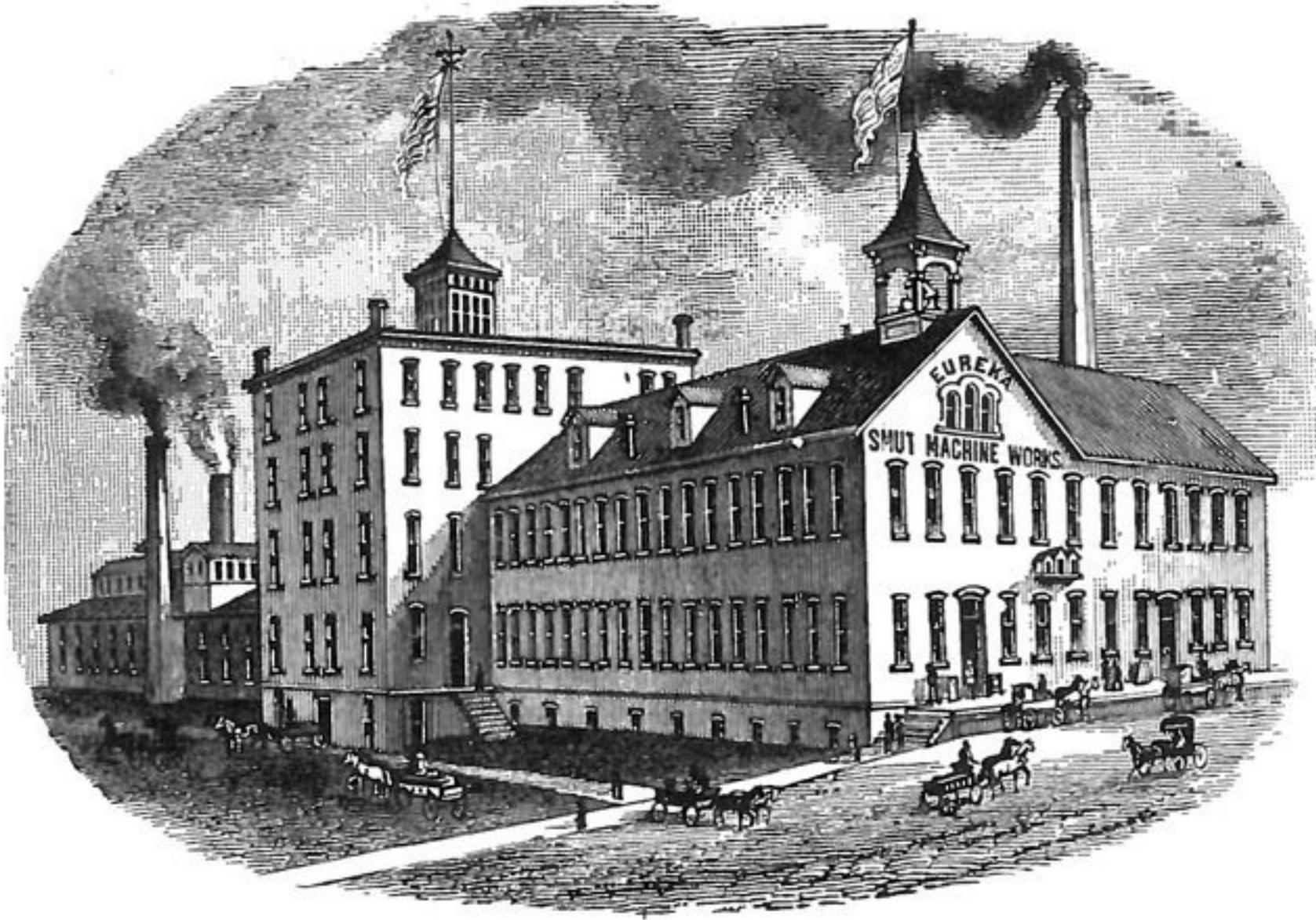
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The Eureka Separator,  
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Eureka Brush Finisher,  
The Eureka Magnetic Automatic Separator,  
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Our establishment is the oldest, the largest and most perfectly equipped of its class in the world, and our machinery is known and used in every country where wheat is made into flour.

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European Warehouse and Office: 16 Mark Lane, London, E. C. Gen. Agency for Australian Colonies and New Zealand. Thos. Tyson, Melbourne, Victoria.



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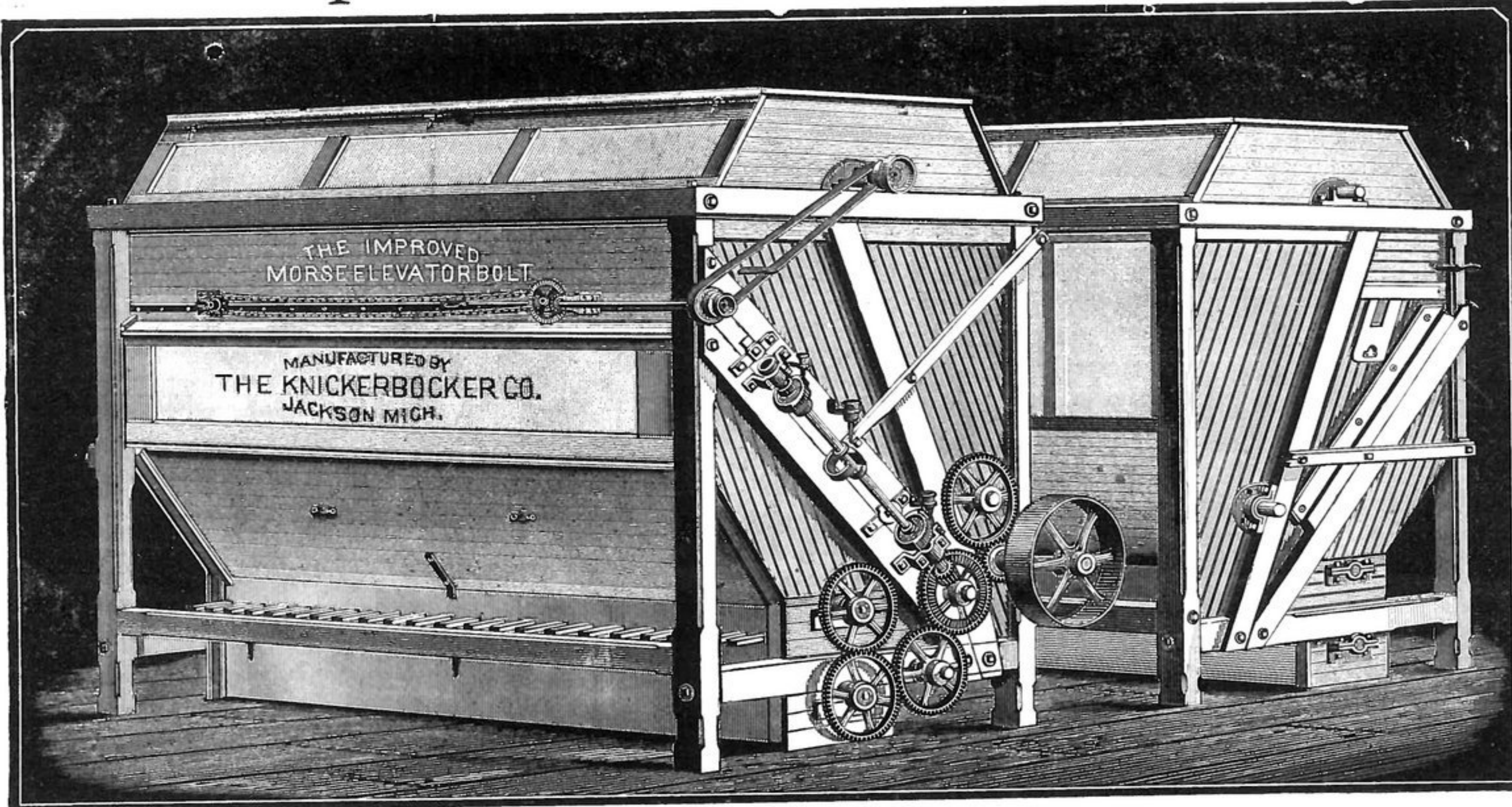
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Guaranteeing it to be equal in every particular to any other cloth on the market, except the Dufour. We have handled it for years, have sold thousands of yards of it, and know it will fully sustain our representations.

Send For Samples of Cloth, Our Style of Making Up, and Prices.

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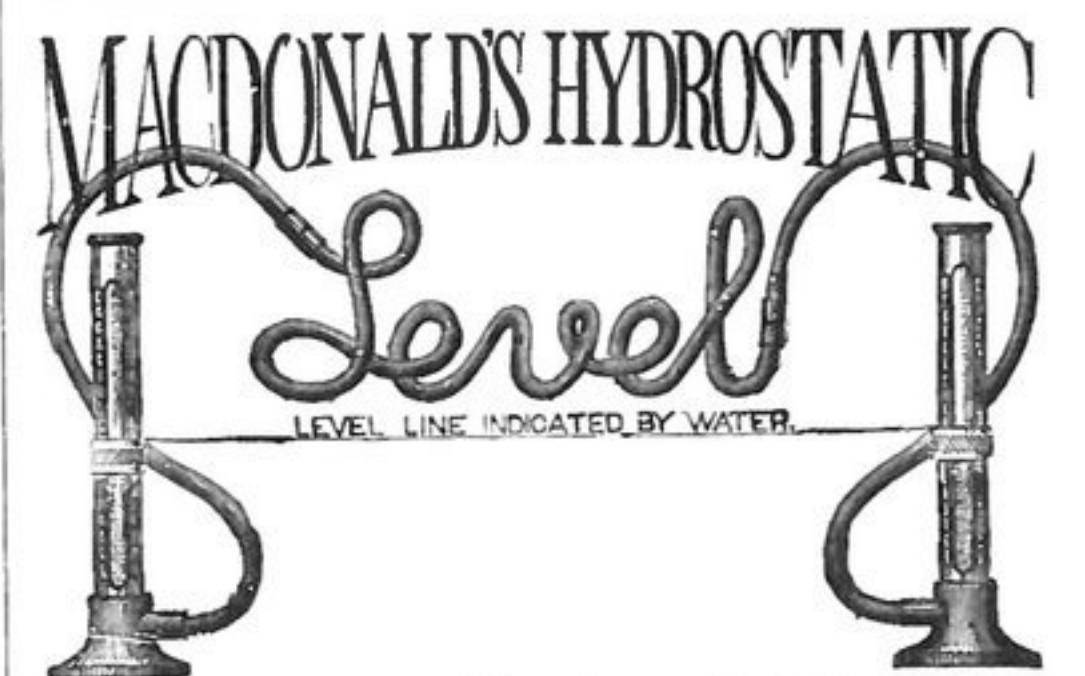


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**THE KNICKERBOCKER CO., JACKSON, MICH.**



A tool for Cutting, Leveling and Polishing the Furrows and Face of Millstones.  
Eight inches long, 2 1/2 inches wide, 1 1/2 inches thick. Received the highest and only Award given to Polishers at the Millers' Exhibition, Cincinnati, Ohio, June, 1880.  
For facing down high places on the buhr, this tool has no equal, and can be done much better and in one-sixth the time than with the mill pick. It is much larger, cuts better, can be used on either face or furrow, can be used until the corundum is entirely worn out on one side and then turned on the other side. Has over four times the amount of corundum and when the corundum is worn out can be replaced in the handle at a small cost. Sent by express, \$3.50. Satisfaction guaranteed, or money refunded. Address  
**HORACE DEAL, Bucyrus, Ohio**



Sight-lines, targets, straight-edges and all other fixings, as well as the extra time and help required to work them with the spirit level, done away with by this instrument.  
**Jas. Macdonald, 55 Broadway, New York.**

## CAREY'S DOUBLE ANCHOR BOLTING CLOTH

Best in the Market. Every Yard Guaranteed Always up to Standard Count.



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**SOLID COTTON BELTING. MILL PICKS.**  
**FINE FRENCH BURR & ESOPUS MILLSTONES**

BELTING.  
PORTABLE MILLS.  
SMUT MACHINES.

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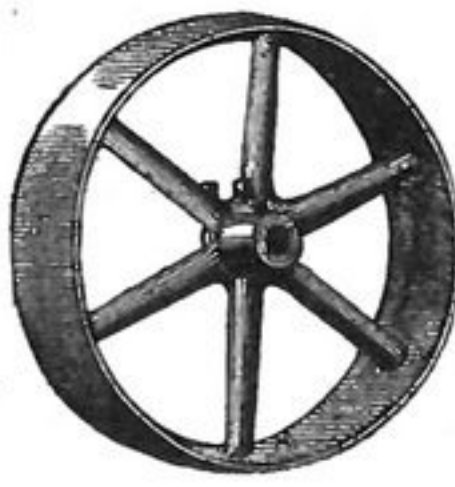
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### A MOUNTAIN RAILWAY.

"It's a short seven miles from Hecla Station, in Brown's Canon, on the Denver & Rio Grande railroad, to Calamut, in the mountains," said a former employe of that road, "but when you get to Calamut you're just half a mile higher up in the world than you were at Hecla. That little branch has the heaviest curves and the steepest grades of any railroad in the world that uses the ordinary drive wheel locomotive to run its cars. A grade of 200 feet to the mile and a fifteen degrees curve—and that's almost like taking the same track back when the cars round it—are common on the mountain division of the Rio Grande, but the Calamut branch hasn't a grade on it less than 400 feet to the mile, and a twenty-five degree curve is no trick at all." That little road winds up the face of the mountain gulches for all the world as if it were an immense snake twisting and coiling itself in the most capricious manner. Why, here in the East, where they drag a train of cars up a plane with 150 feet or so grade to the mile by means of a wire rope, and then let it run down the other side of the hill still held by the rope, they think they have performed a wonderful feat in railroading, and I've known the newspapers to go wild over the marvel. And see how writers use up their pens and artists their pencils describing and picturing the wonders of the mountain railroads of Switzerland, up which the trains tug and labor, aided by the cable and cogwheel system. But here's this stub-and-twist little Calamut branch, climbing up into the clouds, and on which the immense grade is overcome every day by the same kind of a locomotive that they hook on to an express train here in New York and send booming over the level country, and nobody seems to have heard anything about it.

"I worked on this perpendicular string of rails three weeks. They call it 'carrying the hod' out there when you hire out to run on the Calamut branch, for it's about as near climbing a ladder from the sidewalk to the top of the building as anything you ever saw. I might have worked longer at it, because I rather liked the excitement, but one day when we started from Calamut to whisk down to Hecla, with a locomotive, seven cars, an engineer, fireman and seven brakemen, and arrived there with one car and the brakeman that was on it, in just ten minutes, the car being the one I rode on and the brakeman myself, I concluded that I would engage in something where there was less risk, and went out with a party to hunt Sioux Indians. You see the water brake on the engine and the steam brake on the cars got a little out of kilter when we were about half way down, and the hand brake didn't seem to answer the twist very well, and from that time on a streak of lightning couldn't have caught on behind us. One after the other the locomotive and six cars shot off of a curve and took a short route to the bottom of the canon. I don't know how it ever happened, but my car staid on the rails, and I dropped down into Hecla like a meteorite.

"Well, no; they don't make a business of carrying passengers on that Jacob's ladder of a road, but I guess they'll let any one ride if he thinks he can hold his breath long enough to make the trip down the gulch. Calamut isn't much of a place, being principally a hermit iron mine. The ore is very rich, and the Bessemer furnaces at Pueblo must have it. I don't know who ever struggled up there and found the mine, but there it is, seven miles away and half a mile high. They couldn't build a gravity road to it, because the route up the canon was so everlasting crooked. There wasn't one railroad engineer out of a hundred hardly that thought a locomotive could ever ascend and descend the mountain and handle the cars safely, but there was no other possible

way to get at the mine, and they cut the road along the face of the canon and began to experiment. The road is a narrow gauge one. When they first began to operate the road if it wasn't a little the liveliest piece of railroad property in the universe then there's no evidence of the fact in about \$300,000 worth of old iron, incapacitated locomotive boilers, car wheels and timbers, smokestacks, air brakes, hand brakes, and sundry other disintegrated specimens of rolling stock that lie heaped at the bottom of the canon all along that seven miles of cloud-sweeping railroad. The trainmen couldn't get the hang or coasting down the gulch along at first, and there wasn't a day passed but the spectator down below would catch a sudden glimpse of a train far up the face of the mountain, as it dashed like a thunderbolt from the mouth of some cut, and, flying with the speed of the wind, kept straight on its course, unable to follow the windings of the track, and leaped headlong from the precipice, locomotive and cars crashing together in mid-air, grinding themselves into a million fragments, and thundering down in one great heap of ruins at the bottom of the canon at last, 2,000 feet below. Then they knew at Hecla that the brakes had lost their grip, and that the train had refused to wait for repairs. The fellows generally managed to jump when they saw that the air brakes had gone back on them, and there were more broken bones carried down that mountain on their way to Hecla to be mended the first year the lively road was opened for business than they generally lug off of a fair-sized battle field. I never heard of any of the boys sticking by a runaway train in those days and taking their chances in the flying leap into the canon, and I guess only a few were ever killed in jumping. This Calamut branch is so popular with the officers of the Rio Grande that only two of them ever experienced a ride on it from the clouds to the earth. That was some years ago and they never tried it again. Now, when the other officers want to enjoy the trip they sit down and listen to the story of the two who tried it, and turn pale and go home satisfied.

"Well, after a while they got the hang of running trains successfully on the road. They found that, first, they must use locomotives of extraordinary weight, and, second, they must man the trains with men who would stand to their post at all hazards. There is a brakeman on every car. The cars are something like coal cars, and carry five tons of ore each. They are equipped with air brakes and strong hand brakes. The locomotive drivers are checked by powerful hydraulic brakes. It takes an hour and a half for the trip from Hecla to the main summit, but the down trip is made in about 15 minutes. When the train starts from the mine every brakeman stands with his hands on his brake. The air brakes are lightly set, the water brakes given their tightest grip on the locomotive wheels, and the locomotive itself runs with the throttle reversed; yet against all this friction the train thunders the mountain, shooting around the sharp curves and dashing through narrow rock cuts, many of them curved almost double, at the rate of a mile every two minutes. No locomotive can take less than five loaded cars down the canon, because any less resistance than that would be insufficient for the proper gripping of the air-brakes on car wheels. The men who man the hand brakes must be simply bundles of muscle and nerve. Their positive instructions are to work their brakes whenever the air brakes fail, and to stand at their posts in the face of every risk or danger. It happens not a few times in the course of a year that these fearless fellows have to control as best they can some runaway train, and stick to it against the very likely chance that the next curve they strike will topple them, cars

and all, over the brink of an abyss the depth of which the eye can scarcely penetrate, and which yawns directly beneath the flying train. I believe these brakemen have succeeded in taking every runaway during the last year safely down to Hecla Junction.

"It's a sight worth going a good way to watch, from below, the coming of one of these ore trains down the mountain. The tight grip of the steel brake shoes on the car and locomotive wheels drives from every wheel a constant stream of fire which cuts a pathway of light all along the face of the mountain, and whirled along by the flying wheels, takes the fantastic shapes of some brilliant pyrotechnical display, which is made still more fantastic as the flying line of fire follows the many contorting curves of the road, disappearing in some yawning cut, and flashing out again so close to the canon's brink that the scattering sparks drop into the chasm and fall in fiery showers toward its far-away depths. But, while this is a grand scene to the spectator, it is a costly one for the road to provide, for the friction of the breaks on the wheels soon calls for new ones to work on, and it keeps the company busy a great deal of the time renewing the running gear of the Calamut branch."

### EFFECT OF "CORNERS."

From the late report of Consul-General Cramer, of Berne, on the wheat markets of Europe as influenced by the wheat production of the United States, the following is taken: "It becomes more and more evident that on account of the frequent occurrence of so-called 'corners in wheat' in Chicago and New York the price of this, our export article in Europe, is kept not only fluctuating but increasing. The consequence thereof is that England, Germany, Switzerland, &c.—that is, those countries which are obliged to import wheat for home consumption—look about for different markets from which to draw their supplies. Southern Russia, Hungary and East India are already sending large quantities of wheat to the countries just named. For instance, there were imported into Switzerland during the month of July last about 35,546 sacks of wheat by way of Genoa alone, of which 10,746 sacks were from India and 14,800 from Russia, and only a small portion of the whole amount is from the United States. But Genoa is not the only place through which wheat from foreign countries is passing into Switzerland. Havre, Antwerp, and warehouses at different points on Lake Constance—these are places through which wheat is also shipped to Switzerland. Several years ago the largest amount of wheat annually imported into this country came from the United States; now only about one-third of the whole amount imported comes from our country. The reason thereof is that on account of the 'wheat corners' and high cost of transportation in our country the price of our wheat has been increased, while the quantity of wheat grown in Southern Russia, Hungary, and India has been, during the past few years, greatly increased, and the prices of through-freight decreased. Our wheat growers, transportation companies,

and dealers in that article desire to realize large profits, which greatly enhances the prices of our wheat by the time it reaches the European markets, while the Russian, Hungarian, and Indian wheat growers, and the various transportation companies carrying the wheat from these countries are satisfied with a comparatively small profit, so long as their article finds a ready market. It is in this manner that American wheat has to contend with a heavy competition in Switzerland, if not in all Europe. The various railroad and steamship companies of Europe that carry this article are now considering the question of a still greater reduction of the through-freight tariff on wheat from the countries above referred to. If they succeed it will furnish a new impetus to the wheat growers thereof to constantly enlarge their wheat culture. Hence there is danger that we will produce more wheat than can be disposed of unless the original prices and the cost of transportation thereof are reduced. The wheat harvests of this year in Europe and India have been exceptionally good. It has been calculated that unless American wheat can be sold in Liverpool and Havre at \$1 per bushel it will be displaced by European and Indian wheat. Thus our wheat-producing capacity and export will receive a sudden check which cannot fail to bring about much suffering if not many failures in our own country. Let those who are interested in this matter take timely notice thereof."

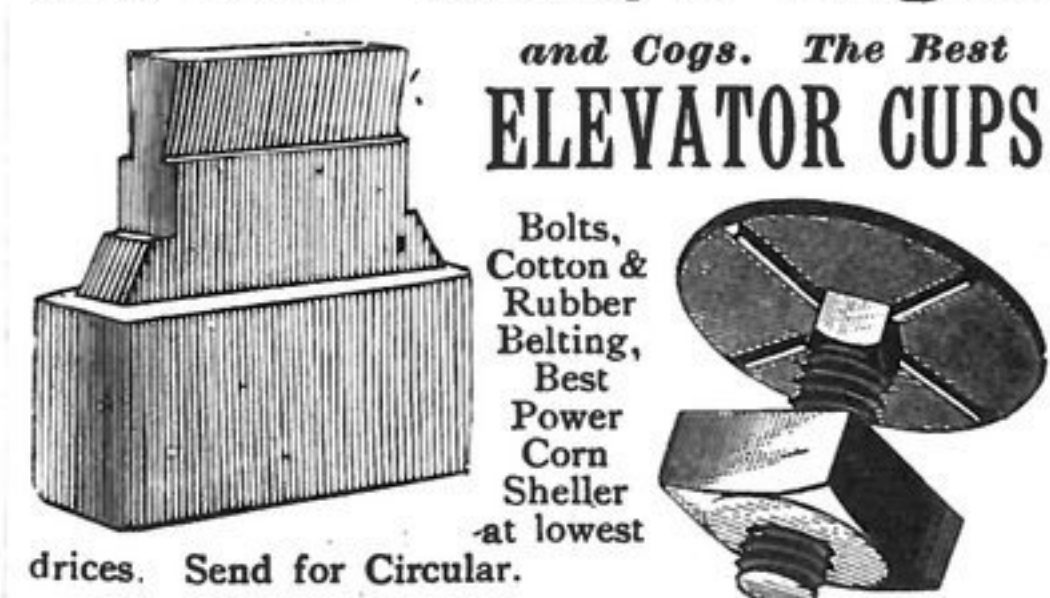
THE German Postmaster General has introduced another practical innovation in the service, namely, that of allowing telegrams to be thrown into the letter boxes, more especially into those attached to the mail cars on railway trains. All that is needed is to write the message on paper, mark it "telegram," and attach the tariff rate in postage stamps, and when these stamps are not at once to be had, these messages may even be sent unpaid or insufficiently, in which case the transmission fee is to be collected from the party receiving it, or if the same can not be found, from the sender. This facility, however, only holds good thus far for the German Empire, exclusive of Bavaria, Wurtemberg and foreign countries.

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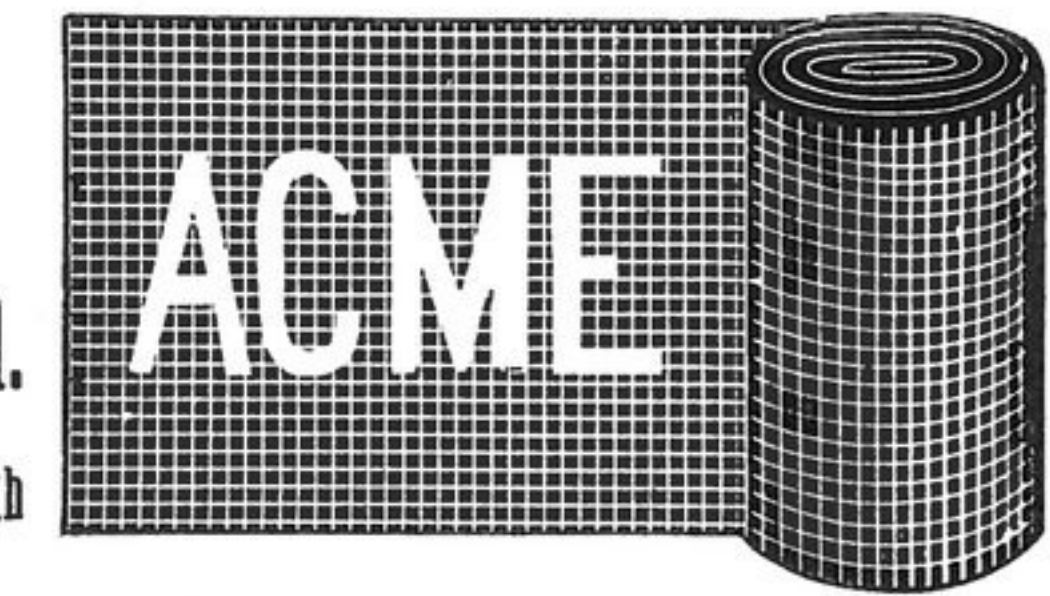
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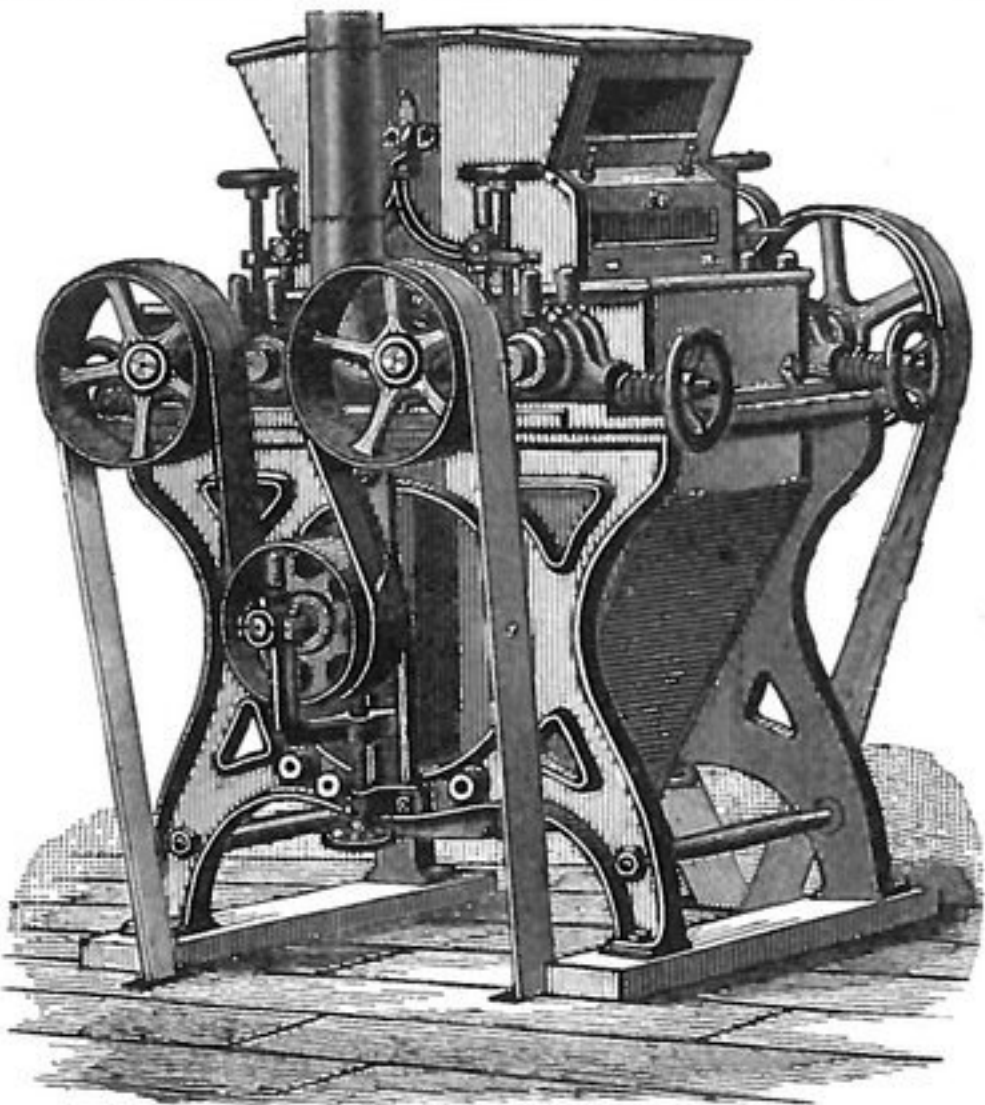
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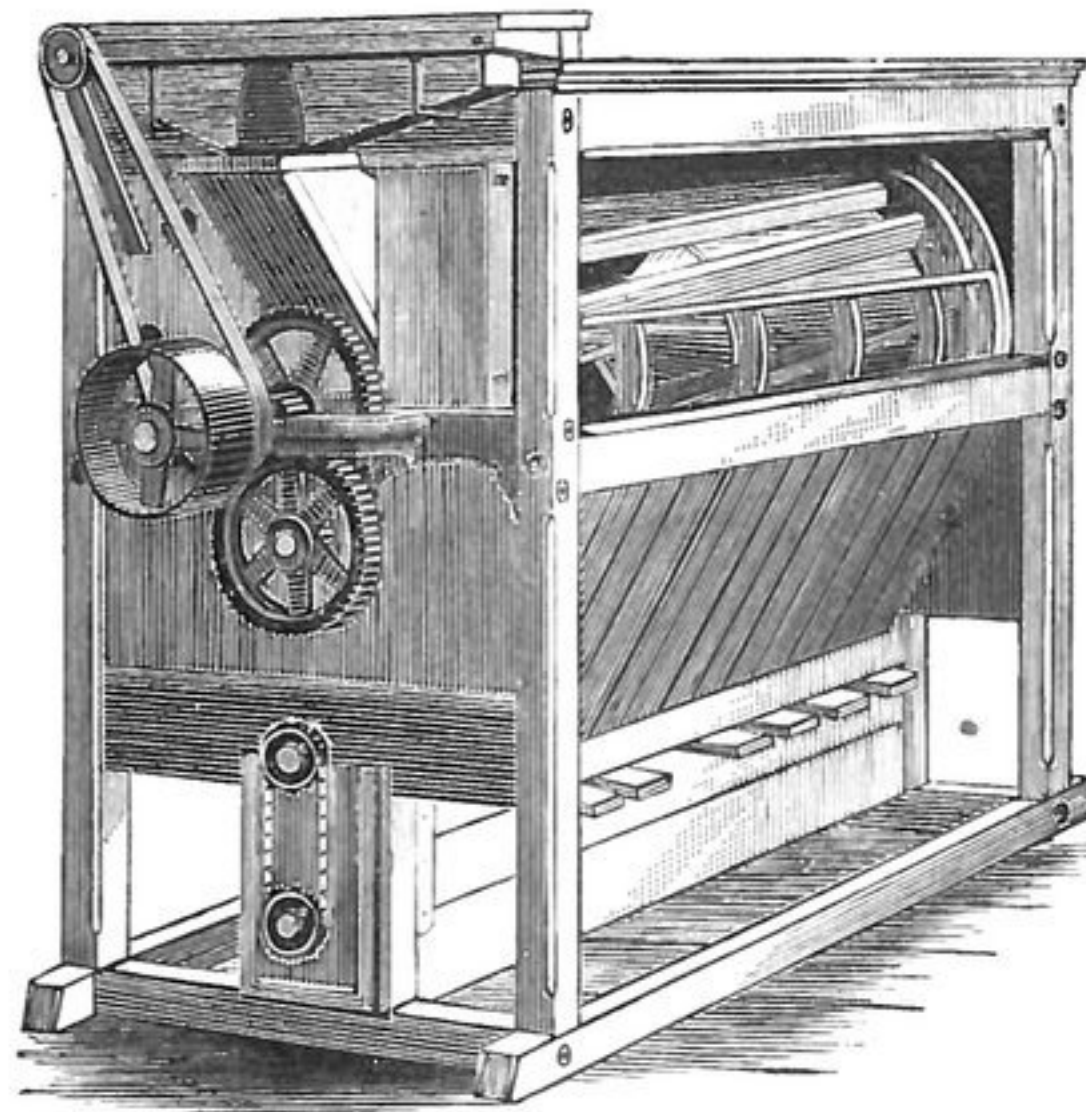
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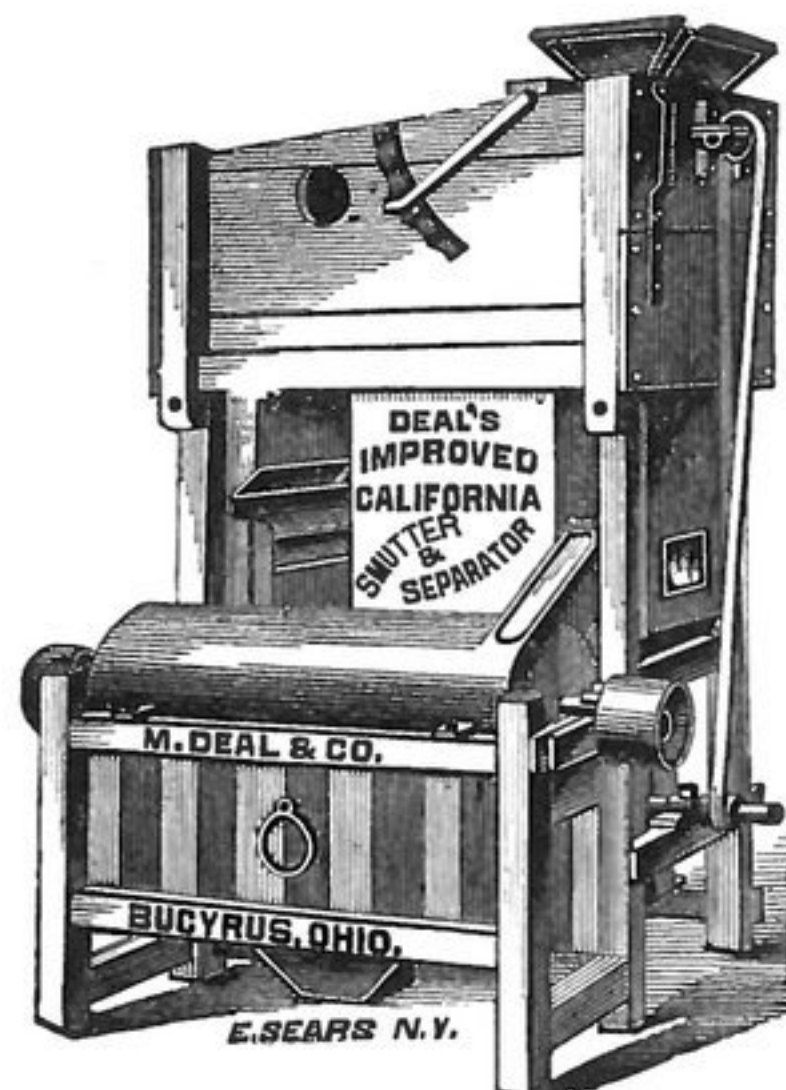
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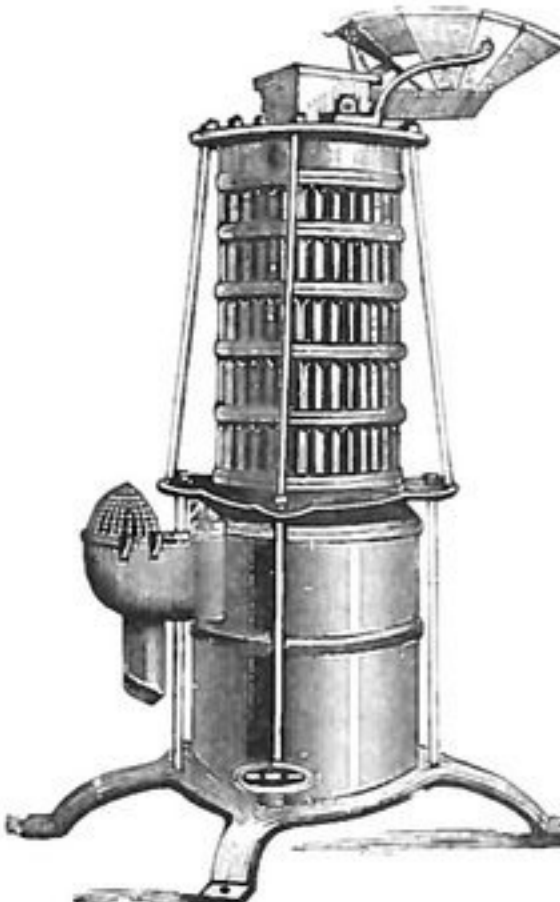
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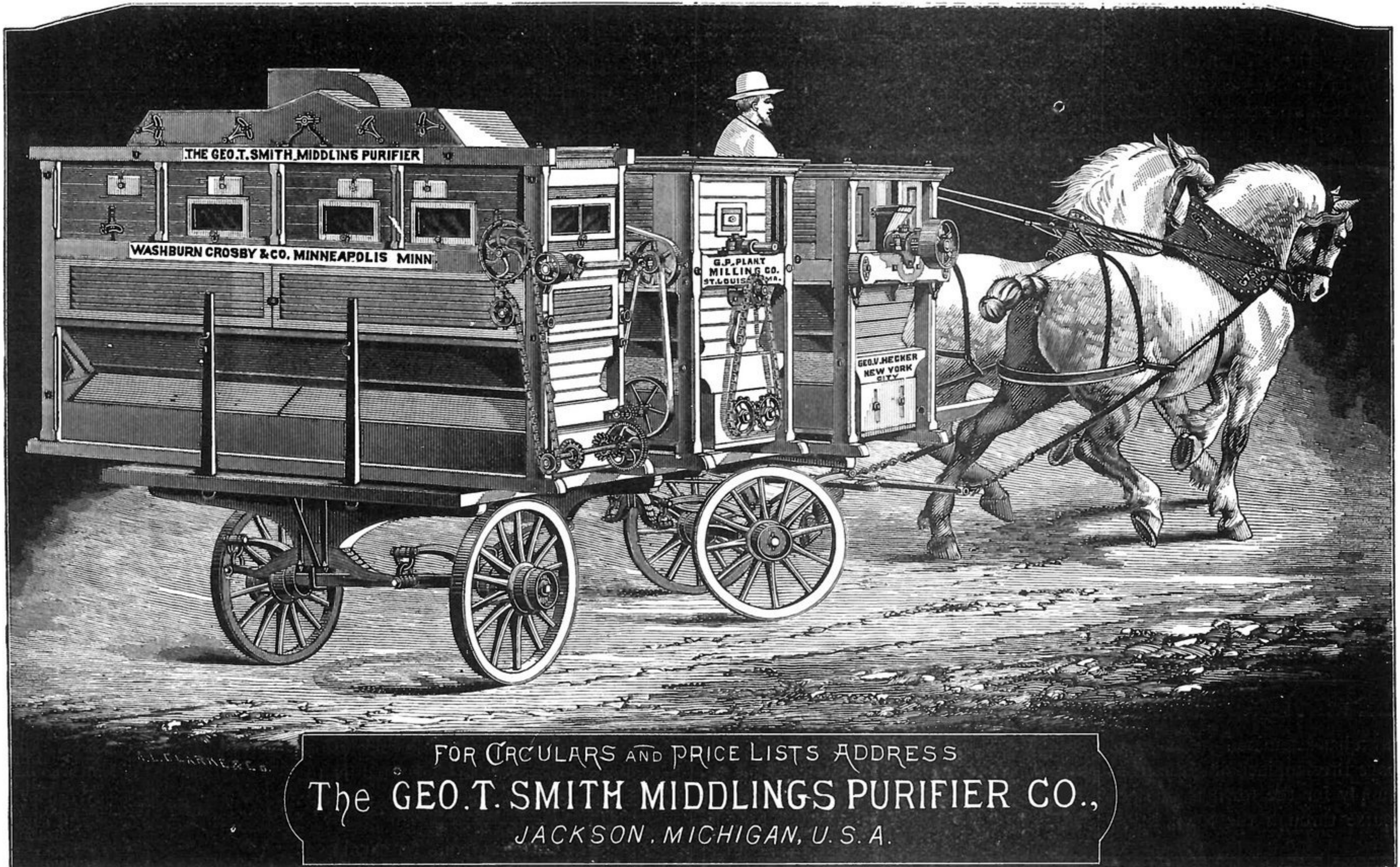
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### MODERN COAL.

It seems probable that vegetable matter may, under certain conditions, be converted into coal much more rapidly than many geologists have supposed. At least a notable instance of an approach toward such conversation has been found in one of the mines of the Upper Harz, Germany; some of the wood originally employed as timbering there has become so far altered as to assume most of the true characters of a lignite or brown coal. The fact, as stated in this connection, is, that certain of the levels in the ancient workings of this mine are filled with refuse matter, consisting chiefly of fragments of clay-slate, more or less saturated with mine water and containing here and there remains of the old timbering. This wood, when in the mine, is wet, and of a leathery subsistence; but on exposure to the air it rapidly hardens to a solid substance, having most, if not all, of the characters of a true lignite. It breaks with a well-marked conchoidal fracture; and the parts which are most altered present the black, lustrous appearance characteristic of the German pitch-coals. At the same time, chemical examination of the altered wood shows that it stands actually nearer to true coal than do some of the younger tertiary lignites—a point which is of peculiar geological interest. Under all the circumstances, the case in question is believed to prove that pine wood when placed under highly favorable conditions, may be converted into a genuine lignite within a period, which, in view of all that is known of the history of mining in the Harz region, cannot have extended beyond four centuries, a comparatively brief period when set against that commonly assigned to coal formations.

### PRICES OF COAL IN EUROPE.

The deposits of coal in France, England and Germany are differently situated, since the price of coal at the mine is twice as great in France as in the two other countries, we are told. Ordinary coal is worth \$2.03 to \$2.50 at the French mines, while in England and the coal basin of Ruhr, Germany, coal is worth only from 96c. to \$1.15 per ton. This makes the average price per ton in France \$2.22, and \$1.06 in the other countries; the difference is \$1.06 cents per ton, which represents 54 per cent. of the cost of the French mine. The low price of English and German coal is due alike to the reasons mentioned above. In the two countries, thanks to their natural conditions, the mines furnish finer and better coal than in France.

The coarser coal, adapted to domestic purposes, finds a ready sale at a remunerative figure, while the small coal, adapted to mechanical use, varying, as it does, with the demand, 77 to 87 cents per ton. The coal basin of the Ruhr in Germany is certainly the most important of the basins of continental Europe. It extends chiefly along the right bank of the Ruhr to the Rhine, a length of about forty-five miles, with a width of twelve miles, and produces annually from 20,000,000 to 25,000,000 of tons. Of this amount two-thirds are kept for home consumption, and the other third is exported to Paris and even to the borders of the Mediterranean.

### SELF-PURIFICATION OF RIVERS.

Franz Hulwa has examined the water of the Oder above Breslau, including the point where the supply for the town is pumped up, in its course through the town, below the sewage outfall, and at the distance of 14 kilos. lower down. He considers that a

good water should contain in 100,000 parts not more than 50 parts total residue, 1.5 of nitric acid, and 3 parts chlorine, and mere traces of ammonia, albuminoid ammonia, and nitrous acid. For oxidation it should not require more than 0.25 part oxygen. From Ohlau down to a little above Breslau the water undergoes a slight but appreciable deterioration, yet after filtration it is quite suitable for domestic uses. In passing through the city there is a continuous change for the worse, manifested by the increase of oxidisable matter, and by the higher proportion of ammonia and nitric and nitrous acids. Below the sewer outfalls the water is exceedingly impure; there is an increase of total solids, of oxidisable matter, and of chlorine, whilst the ammonia and albuminoid ammonia are augmented a hundred. Microscopic examination detected the abundant presence of organisms of putrefaction. Further down was observed a gradual process of self-purification by contact with atmospheric oxygen along with the co-operation of vegetable and animal life in the stream. Fourteen kilos. below Breslau the influence of the sewage could no longer be detected either chemically or microscopically, the water being of the same composition as at the supply station above the city.

"The inventive genius of man," says the Newark Advertiser, "has been largely devoted to the protection of dwellings against burglars, and electric mats and guarded windows send information to the police, sometimes in advance of any knowledge of the owner that he has been visited by unwelcome guests. Formerly bolts and bars, thick walls and iron shutters were relied on, but now banks and other business establishments rely more upon a plate glass window, a gas burner and an electric wire than they do upon all the devices that oppose iron and stone to brute strength. But invention never comes to an end, and the last novelty is somewhat bewildering. It is a new protection against fire, the ordinary thermometer being utilized to give the alarm. This is done by the attachment of an electrical apparatus so adjusted that any unusual heat in a room will affect the thermometer and cause it to ring a bell, and so to give the alarm. It is suggested very properly that this device can also be used to warn the occupants of rooms when they are enduring a heat injurious to health. There are too many people who stifle themselves, entirely unaware that they are violating the laws of health, and it is the case also in school rooms and places of public resort. One of the theatres in this city is often almost unendurable from the combined heat and bad air, and if a note of warning could be sounded it would be a charity. These little things show how electricity is yet to be applied for the comfort of the race."

Some experiments have been made by E. Bourquelot on the action of the soluble ferment of yeast (invertin) on starch. The invertin was obtained from bakers' yeast, which is prepared by sowing yeast in a mixture of rye or maize meal with malt; this has a little diastase mechanically adhering to it. Fifty grains of this yeast were mixed with 100 cc. of distilled water, and after standing, the solution was filtered. The residual yeast was treated with water in this way four times in succession. The four solutions were all found to be rich in invertin, indicated by its hydrolytic action on cane sugar. These liquids were allowed to act for some hours on gelatinized starch, after which it was found, by testing with iodine, that the first solution alone exercised a hydrolytic action on the starch, and this only to a feeble extent, which the author supposes is due to adherent diastase; the other liquids had no action on the starch. The author concludes that invertin, unlike diastase, has no hydrolytic action on starch.

Do we not pay thousands every year to see and admire those whose life has been spent in acquiring skill in a single direction, while we pass the skillful workman, whose productions are equally marvelous, with but a passing thought, said President Sweet of the Society of Mechanical Engineers at their recent meeting. May the time come when we shall have a museum in which there shall be gathered the finest specimens of workmanship, with the masterpieces of our great engineers, where the works of men and the growth of industries shall be represented. May the time come when more of the mechanical branches of our educational institutions shall find their true position, and where the students shall be instructed by examples of noble work, rather than by the toy models abounding in confusing complication, which they cannot understand, and which are constructed regardless of proportion and meaningless in design, and are pernicious in every sense of the term.

The Cotton Exchange and the Merchant's Exchange, of Memphis, Tenn., on the 30th ult., reconsidered the action taken at a former meeting indorsing the outlet theory of Captain John Cowden for the improvement of the Mississippi River, and making an outlet from the Mississippi to Lake Borgue, some ten miles below New Orleans. The resolutions previously adopted were rescinded and confidence was expressed in the skill and wisdom of the U. S. Engineers and the Mississippi River Commission, if properly supported. Assurances were tendered on behalf of the exchanges of co-operation with the Commission and the various State Boards south of Memphis now acting in conjunction, in their efforts to solve these great problems, at least until such time as present plans and purposes shall have been fully tested.

The international committee of weights and measures, whose work is chiefly to test the standards of measurement used in the different countries, was established at Paris in 1875 by a convention of nations, but has only just received the adhesion of England. With the further accession of Roumania and Servia, the committee now represents an aggregate population of 421,440,000, distributed over Germany, England, Austria, Hungary, Belgium, the Argentine Republic, Denmark, Spain, the United States, France, Italy, Peru, Portugal, Roumania, Russia, Servia, Sweden, Norway, Switzerland, Turkey and Venezuela.

It became necessary to drain one of the deep mines at Ashley, Pa., and to get the water to the surface a 16-inch pipe was required to lead from the pump to the surface, a distance of more than 400 vertical feet. A hole to take a pipe that size would have to be over 18 inches in diameter. John Muirhead, of that place, succeeded in putting down a hole 18½ inches in diameter, and the rock was found so solid that no pipe was necessary, and the water is pumped through the hole to the surface. The hole was first put down 5 inches in diameter, and then enlarged by a special tool invented by Mr. Muirhead, for the purpose.

An extended series of experiments and a study of the records of such phenomena has convinced Hirsch, a French engineer, that there is no evidence that boiler explosions have been caused by superheated water. If they occur at all, the instances are very rare and from a combination of circumstances seldom observed, not well understood or clearly defined. The conclusions have been reported to and adopted by the Commission Centrale des Machines a vapeur.

The following paint for wood work or metal is recommended by the "Tech-

niker." A mixture of zinc white and chloride of zinc becomes very hard, and can be washed or brushed if painted on during dry fine weather; if done during rain or frost, it peels off. Chloride of zinc can be substituted by sulphate or nitrate of zinc; sulphate, nitrate or chloride of iron, or by the sulphate or nitrate of manganese.

The "Hennepin Canal Commission" of fifty is called to account by a correspondent of the Davenport Gazette who desires to see them galvanized into life. He asks some pertinent questions and in conclusion delivers himself of the following dicta: "Causes produce effects. Judiciously applied effort alone prevails. Enlightened public sentiment must precede legislation on popular national measures."

The Hartford Water Commissioners have received scores of complaints of water pipes clogged by eels and fish. From the pipes of the Gheney buildings elevator 64 young perch have been taken, and 58 were removed from the pipes connected with the Charter Oak building elevator. The presence of fish in these pipes is accounted for by the scarcity of water in the reservoirs.

Notwithstanding the complaints about the decline of ship-building in the United States, it appears that twenty-two thousand men are employed in that industry. The value of vessels built yearly is about \$40,000,000, and \$22,000,000 is invested as capital by the ship-builders.

The Russian government has projected an experiment to ascertain whether naphtha residuum can be advantageously used as fuel for the engines of steamers. If the experiment is successful, the adoption of this substance instead of coal as fuel for the Russian fleet is contemplated.

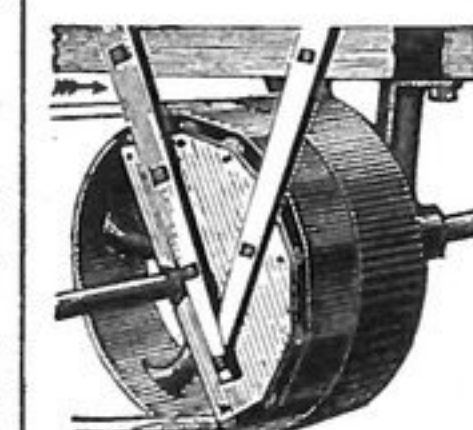
Some recent trials show that very thin blades can be effectually hardened and tempered by heating them and thrusting them into a mass of mineral wax—crude paraffine. The needles of sewing machines and small drills have in this manner been so treated successfully.

At Cornell University the workshops for the students consist of machine shop, foundry, blacksmith, boiler shops, and mechanical laboratory. These shops contain \$100,000 worth of machinery.

About \$15,000 are necessary to defray the expenses of Michigan's exhibit at the New Orleans Exposition. This amount, the commissioners think, can be raised with very little difficulty.

According to a French authority, the vibrations caused by a moving railway train a mile distant may make the use of delicate astronomical instruments impossible for the time being.

## The Wellington Belt Holder.



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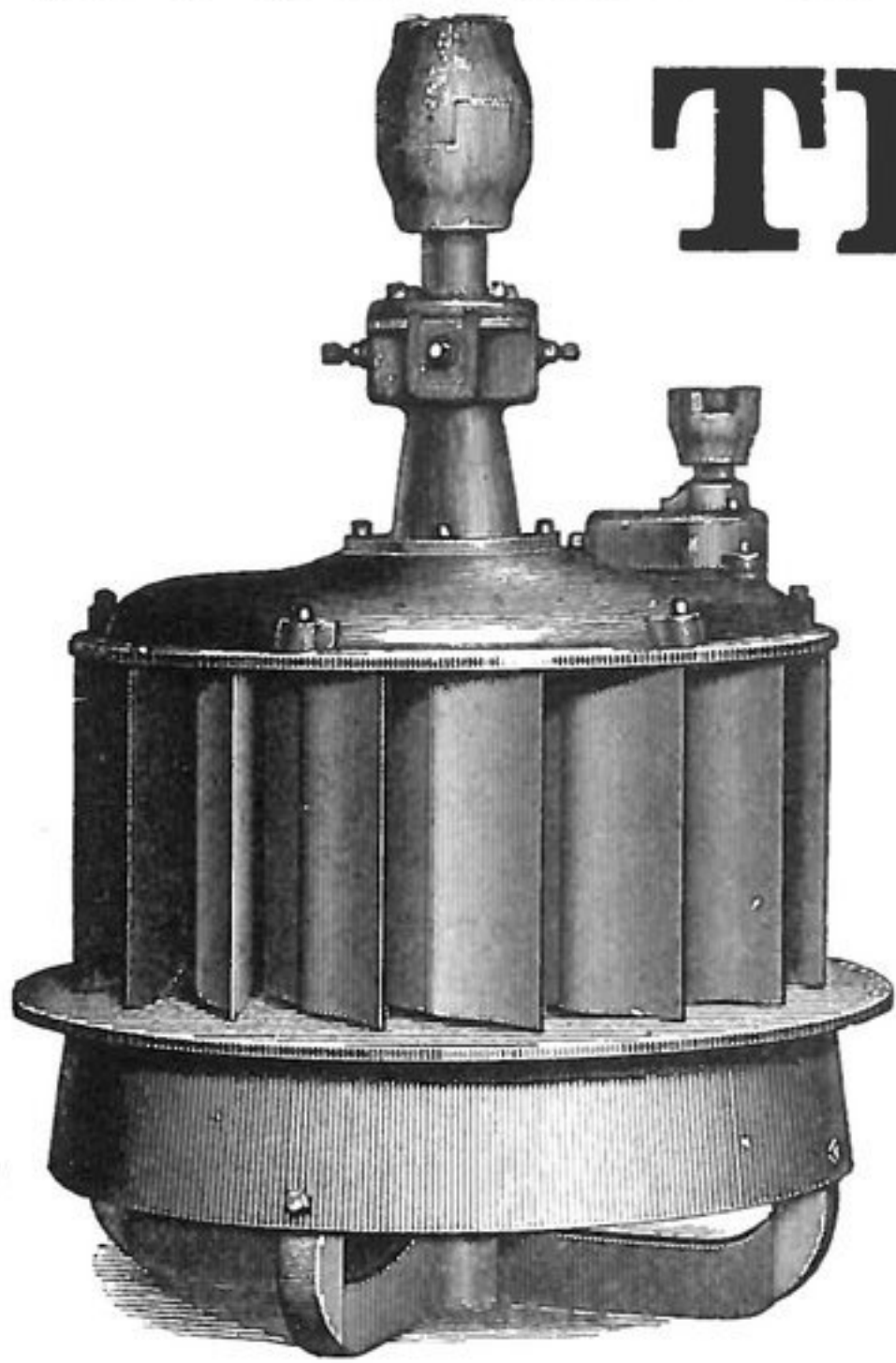
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Simplest and Cheapest Manufactured, and have received the unqualified endorsement of all who have used them. Every small Mill can afford one. Send for large Illustrated Catalogue of Wheels and General Mill supplies. "The Star Grind" Mill stones from our quarry are unsurpassed and sell remarkably low. A. A. DeLoach & Bro., Atlanta, Ga. U. S. A.





# THE VICTOR TURBINE

Possesses more than Double the Capacity of other Water Wheels of same diameter, and has produced the Best Results on Record, as Shown in the Following Tests at Holyoke Testing Flume:

Size Wheel.	Head in Ft.	Horse Power.	Per Cent Useful Effect
15-inch.	18.06	30.17	.8932
17 1/2 in.,	17.96	36.35	.8930
20-inch.	18.21	49.00	.8532
25-inch.	17.90	68.62	.8584
30-inch.	11.65	52.54	.8676

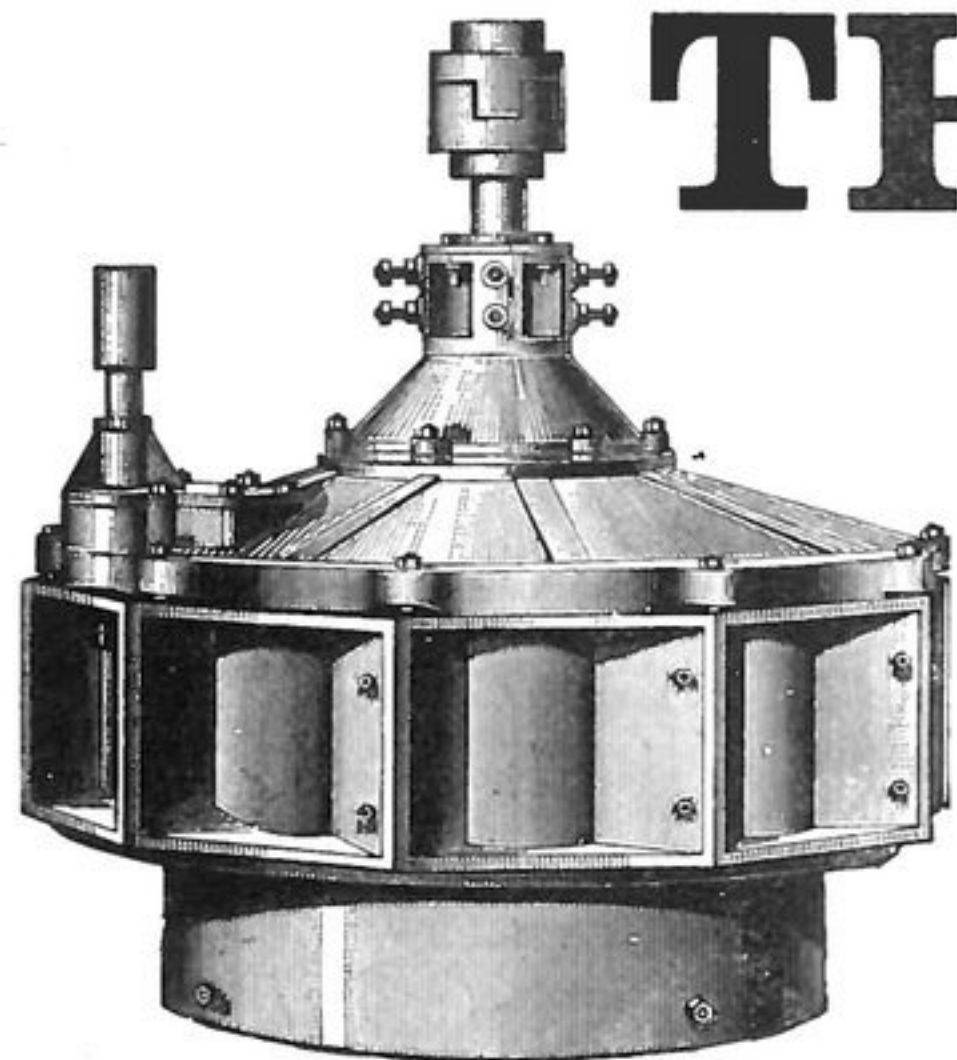
WITH PROPORTIONATELY HIGH EFFICIENCY AT PART-GATE.

Such results, together with its nicely-working gate, and simple, strong and durable construction, should favorably commend it to the attention of ALL discriminating purchasers. These Wheels are of very Superior Workmanship and Finish, and of the Best Material. We also continue to manufacture and sell at very low prices the

## ECLIPSE DOUBLE TURBINE,

So long and favorably known. State your requirements, and send for Catalogue to the

**STILWELL & BIERCE MANUFACTURING CO.,**  
DAYTON OHIO U. S. A.



# THE EUREKA TURBINE

CELEBRATED AS THE BEST PART-GATE WHEEL EVER BUILT. ABSOLUTELY UNEQUALLED IN EFFICIENCY, AS SHOWN BY THE ACCOMPANYING TABLE.

From the Records of Actual Tests at the Holyoke, Mass., Testing Flume:

### PERCENTAGE OF EFFICIENCY.

	Full Gate.	3/4 Water.	1/2 Water.	1/4 Water.
24 Inch Wheel.....	.8436	.8416	.8202	.8002
24 Inch Wheel.....	.8306	.7910	.7700	.7003
24 Inch Wheel.....	.8078	.7578	.7275	.6796
30 Inch Wheel.....	.8000	.8011	.7814	.6850

WE PUBLISH OUR PART-GATE FIGURES. OTHERS SIGNIFICANTLY OMIT THEM.

No Other Turbine Ever Approached the Above Percentages at Part-Gate.

For Catalogue and Information Address,

**W. H. BARBER & CO.,** ENGINEERS AND MACHINISTS **ALLENTOWN, PA., U. S. A.**

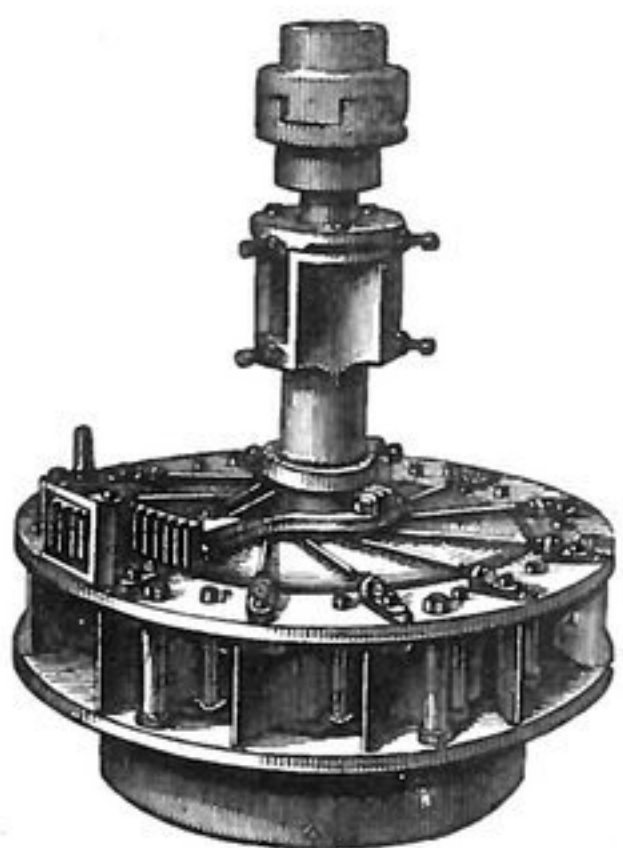
# LEFFEL'S WATER WHEEL

MADE BY JAMES LEFFEL & CO.

The "OLD RELIABLE"

with improvements, making it the

**MOST PERFECT TURBINE**  
NOW IN USE.



Comprising the Largest and the Smallest Wheels, under both the Highest and Lowest Heads used in this Country. Our new Illustrated Book sent free to those owning water power.

Those improving water power should not fail to write us for New Prices before buying elsewhere. New Shops and New Machinery are provided for making this wheel. Address

**JAMES LEFFEL & CO.,** SPRINGFIELD, OHIO, AND 110 LIBERTY STREET, N. Y. CITY.

## BURNHAM'S IMPROVED Standard Turbine

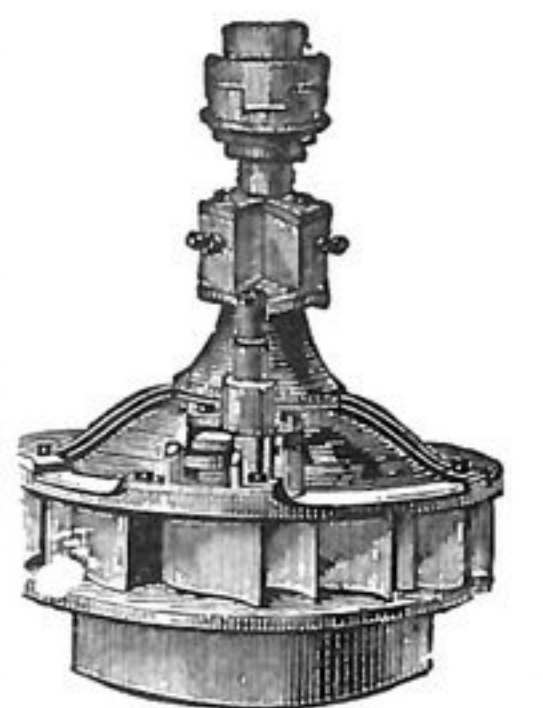
IS THE  
Best constructed and finished,  
gives better Percentage, more  
Power, and is sold for less  
money, per horse power, than  
any other Turbine in the world.  
New Pamphlet sent free by



Burnham Bros., York, Pa.

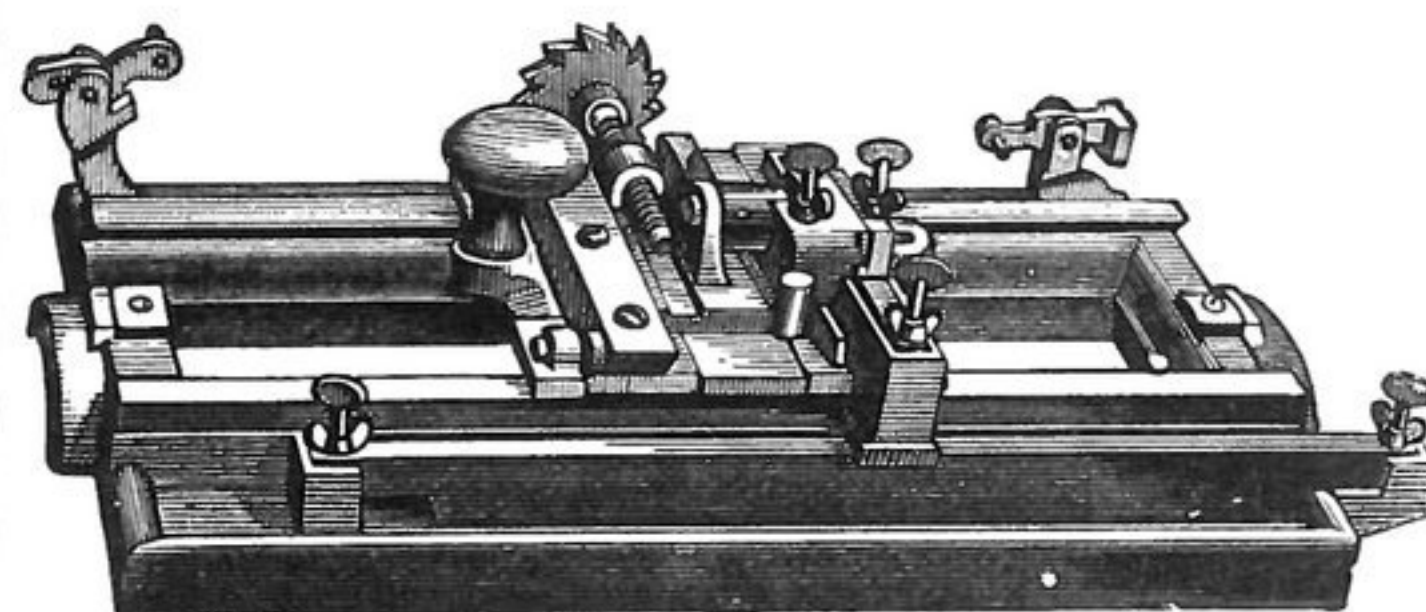
## MERCER'S RELIABLE Turbine Water Wheel.

This wheel is acknowledged one of the best on the market. Has valuable improvements in the construction which is commanding the attention of buyers. Send for catalogue and price list. T. B. MERCER,



WEST CHESTER, PA.  
CHESTER CO., PA.

## HOOVER'S IMPROVED DIAMOND MILLSTONE DRESSING MACHINE.



### ADAPTED TO ALL KINDS OF DRESSING.

No 1, to face and crack	\$25.00
No 2, to face, crack, dress furrows, and will dress any size stone.....	45.00
No 3, to face, crack and dress furrows.....	40.00

Will do as good work, and is more easily adjusted than any other machine. Sent on 30 days' trial. Address for circulars, containing full information.

C. S. HOOVER, Patentee and Manufacturer 409 East King St., LANCASTER, PENN.

## PORTABLE FORGES

Empire Portable Forge Co.  
Cohoes, N. Y.  
Send for Catalogue.

## POOLE & HUNT'S LEFFEL TURBINE WATER WHEELS

Made of Best Materials, and in the Best Style of Workmanship.

## MACHINE-MOLDED MILL GEARING

From 1 to 20 feet diameter, of any desired face or pitch, moulded by our own Special Machinery.

## SHAFTING, PULLEYS AND HANGERS

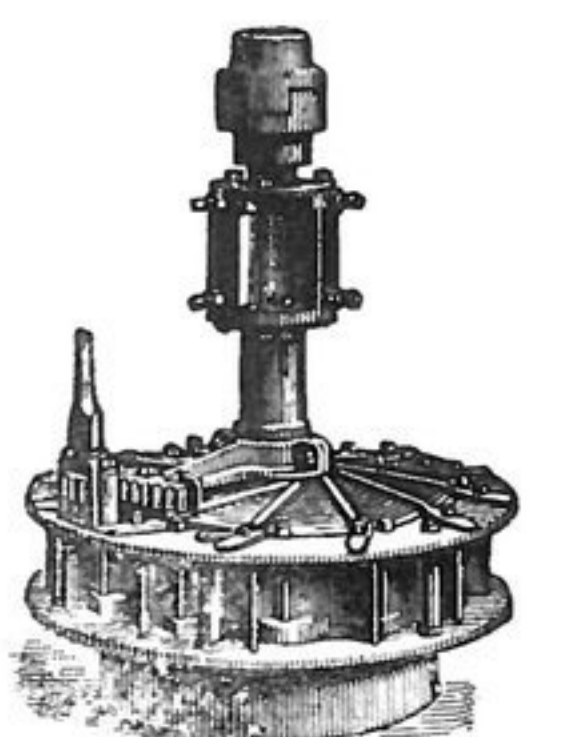
Of the Latest and Most Improved Designs.

## Engines, Boilers,

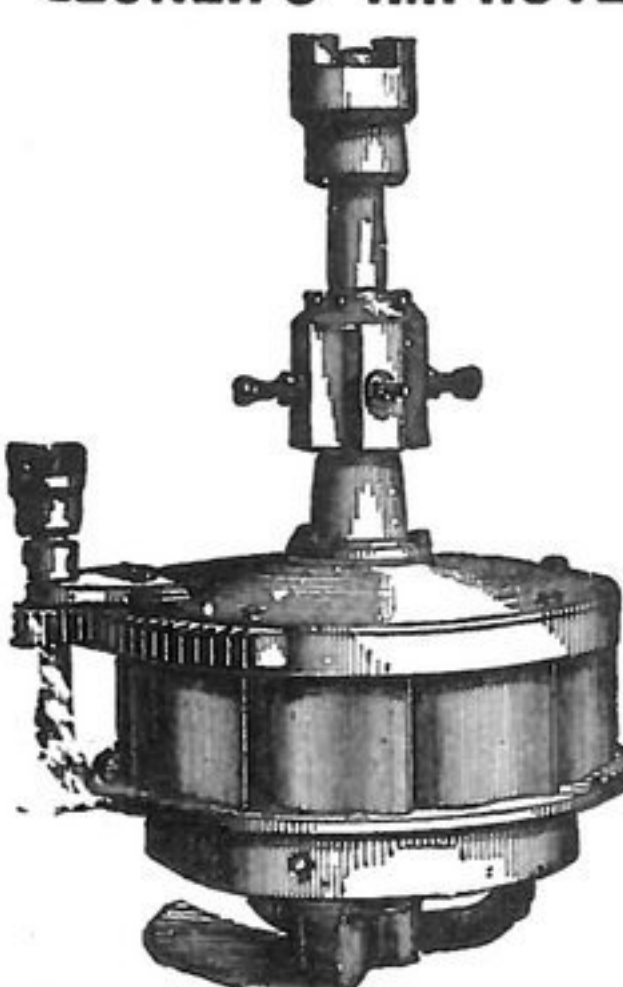
## Mixers and General Outfit for Fertilizer Works.

Special Attention given to Heavy Gearing. Shipping Facilities the Best in All Directions.

**POOLE & HUNT, BALTIMORE, MD.**



## LESNER'S IMPROVED TURBINE.



Simple,  
Durable,  
Strong.  
Gate Works  
EASILY  
—AND—  
RAPIDLY.  
PERFECT  
Satisfaction  
—IS—  
GUARANTEED.

W. B. WEMPLE'S SONS, FULTONVILLE, N. Y.

## Improved Success Percentage.

Full Gate.....	86.29
3/4 Gate.....	86.07
1/2 Gate.....	81.90

This Wheel is Durable and Cheap.

Send for Pamphlet to  
S. MORGAN SMITH,  
YORK, PA.

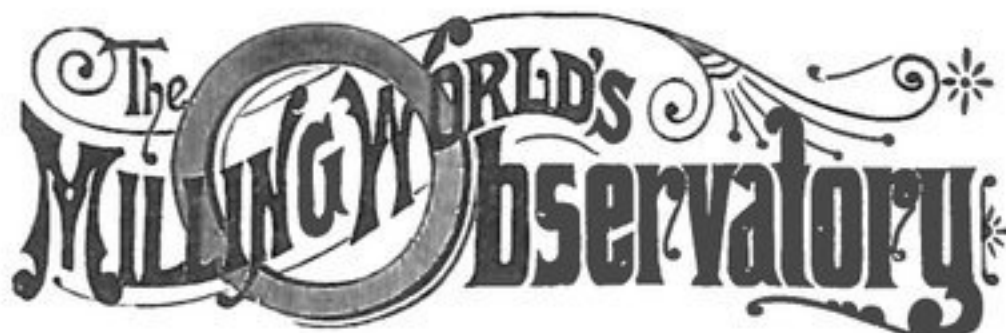


This Wheel gives high results, and is acknowledged the best, most practical and efficient Turbine made. For Simplicity, Durability, and Tightness of Gate it has no equal.

State requirements and send for Catalogue to

**T. C. ALCOTT & SON,**  
MOUNT HOLLY, N. J.





### Notes from the Mills.

The new Payn flour mill in Fergus Falls, Minn., started up Nov. 5.

Uncle Sam is erecting a flouring mill at the Santee Agency, Dakota.

C. K. Griggs has commenced the erection of a grain elevator at Rochester, Mich.

A grain elevator and warehouse are being built at Newberne, N. C., by J. A. Meadows.

At Cincinnati, O., Nov. 15, James K. Hurin's flour mill was damaged by fire. Loss, \$20,000.

Mills in different parts of New Hampshire have been obliged to shut down for want of water.

A steam flour mill is about to be erected at Cannington, in the Moose Mountain District, Ont.

The new stone flour mill at Yorkton, York Colony, Ont., is advancing rapidly. This mill will be fire-proof.

W. H. Payne intends to build a flour mill at the foot of East One Hundred and Twenty-ninth street, New York City.

The Case Mfg. Co., Columbus, O., have an order from J. Gregg, Blanchester, Mo., for one "Little Giant" break machine.

Ira McClure, St. Paris, O., is putting in two pairs of rolls with patent automatic feed, furnished by The Case Mfg. Co., Columbus, O.

The Case Mfg. Co., Columbus, O., have an order from F. M. Turley, Stergem, Mo., for breaks, rolls, purifiers, centrifugals, etc.

Clay, the smallest county in Dakota, produced 3,000,000 bushels of corn this year, of which 40 bushels will be sent to the New Orleans exposition.

The Case Mfg. Co., Columbus, O., have an order from Marshall, Kennedy & Co., Pittsburgh, Pa., for two patent automatic feeds for their Stevens rolls.

M. D. Massie, New Canton, Ill., is making some changes in his mill and is adding one pair of rolls, with patent automatic feed from The Case Mfg. Co., Columbus, O.

The Case Mfg. Co., Columbus, Ohio, have an order from W. T. Pyne, Louisville, Ky., for seven pairs of rolls, with patent automatic feed for B. Smith, Milton, Ky.

W. T. Pyne, Louisville, Ky., has ordered one pair of rolls with patent automatic feed from The Case Mfg. Co., Columbus, O., for W. B. Patterson, Charlestown, Ind.

Kerfoot Bros., Des Moines, Iowa, have ordered four pairs of rolls with patent automatic feed from The Case Mfg. Co., Columbus, O., to be shipped to Corey Bros., Lehigh, Ia.

Messrs. Askew & Sons have a new roller mill in Essex county, Ont. The contract for supplying the machinery and fitting up the mill was executed by a Toronto firm for \$5,000.

The Smithton Flour Mill at Belleville, Ill., after being closed for about a year, by the assignment of the proprietors, has been put to work again under the management of William Daesch.

The Case Mfg. Co., Columbus, O., have secured the contract of A. Hulshizer, Utica, Ohio, for a complete line of breaks, rolls, purifiers, centrifugals, scalpers, bolting chests, etc., for a full gradual reduction mill on the Case system.

The "Wolverton flour mill," at Wolverton, Ont., owned by Wolverton & McJanet, is now running night and day, and 125 barrels are shipped daily, but owing to the scarcity of water, the full capacity is not turned out.

At Gethsemane, Ky., Nov. 14th, the large flour and saw mill belonging to the Gethsemane Abbey burned, caused by sparks falling on the shed. The value of the mill was \$13,000. A large lot of lumber and grain was also burned. No insurance.

McDougall & Brandon are about to commence the erection of a steam grist mill at Fenelon, Ont. The mill will be a brick-veneered frame structure, about fifty feet square, and will be built under the superintendence of Mr. Robert Allen, a practical miller and machinist.

The sunset route (Southern Pacific) expects to haul 13,000 car-loads of California wheat for export to Liverpool, rail and ocean freight to amount to 27 cents per bushel. On the assumption that the railroad gets five-tenths of that amount. It is calculated that it will receive  $\frac{1}{4}$  cent. per ton per mile.

The \$25,000 capital stock in the Rochester, Mich., Roller Process Flour Company, has all

been taken, and the company has commenced remodeling and enlarging their building (the old Gillett & Andrews mill), and expect to get in the rollers and commence operations during November.

The Case Mfg. Co., Columbus, O., have been awarded the contract of E. F. Mullay, Walnut City, Kan., for a full line of breaks, rolls, purifiers, centrifugals, scalpers, bolting chests, etc., for a complete gradual reduction mill on the "Case" system, using twelve pairs of rolls with patent automatic feed.

In the nine years ending with 1883, there were no less than 1,725 fires in flour mills in the U. S., the number in 1883 being 291, which showed a great increase over several previous years. Consequently, it is not to be wondered at that American insurance companies argue that the fire hazard of flour mills has largely increased within the past few years.

At Philo, near Champaign, Ill., Nov. 10, two fires occurred. W. D. Dorrough's elevator and mill, with machinery and contents, including 2,000 bushels of corn owned by Van Vleck Bros. & Hazen, were wholly destroyed. Loss, \$6,000. Mr. Grove's large barn was also burned, probably by a tramp who had made threats. One hundred tons of hay and 2,000 bushels of corn were also destroyed, with much valuable farm machinery. Insurance, \$3,000.

The comparatively large amount of grain said to be out of condition in Brooklyn warehouses, unless much forbearance is shown, is likely to be productive of some feeling among members of the trade. It is not within our province at this moment to make any specific recommendations to the Committee on Grain, though it is evident that a little more attention on the part of somebody would prevent the continued apprehension felt by the trade, and at the same time cause less trouble and annoyance to the Committee itself.

F. W. Noble, general manager of Michigan's state exhibits for the World's fair at New Orleans, has in his office in Detroit, some excellent samples of wheat, oats and corn, sent him for exhibition from Wayne county; oats weighing 44 pounds per bushel and yielding 80 bushels to the acre; wheat weighing 64 pounds per bushel and yielding 35 bushels per acre, and corn yielding 120 bushels per acre. Mr. Noble says he is well pleased at the progress being made. He hopes to receive from the farmers samples of cereals from every county where any considerable agricultural products are grown.

All Minnesota's flour mills have a capacity for turning out 50,000 barrels of flour a day, one half the capacity being in Minneapolis. In 1881 there were 5,800,000 barrels manufactured in the state; in 1882, 4,600,000 barrels; in 1883, 8,000,000. The sales of the flour produced were, for 1881, \$23,200,000; 1882, \$18,400,000; 1883, \$32,000,200, and for 1884, \$35,200,000. In addition to the flour the mills turned out other mill stuffs as follows: In 1881, 152,000 tons worth \$1,368,000 in 1882, 145,000 tons, worth \$1,305,000; in 1883, 200,000 tons, worth \$1,800,000; and in 1884, 250,000, worth \$2,250,000.

The movement of grain has now begun in earnest all along the line of the Canadian Pacific railroad. The late frosts have put a stop to plowing, and the trails to the line being in good condition, the quantity offered for sale has increased nearly double. The price rates about 50 cents per bushel and it is expected that the receipts will amount to about 140,000 bushels per week for the next month. The Canadian Pacific Railroad company have made very extensive arrangements for the accommodation of shippers, and it is probable that the lake boats will take all the grain that can be shipped for the next two weeks.

November returns to the Department of Agriculture show that corn yield exceeds eighteen hundred million bushels, and average rate of twenty-six bushels per acre. The best yields are in what has been designated as the great American desert. The "arid regions," in the vicinity of the hundredth meridian, have produced heavy crops of maize of a high quality. The line of longitude has ceased to be an absolute barrier to corn production or general farming. The New England States average nearly 38 bushels, New York 30, and Pennsylvania 31 per acre. The quality of corn is better than in 1883 nearly everywhere, and in the Northern belt it is worth twenty-five to seventy-five per cent. more.

On Nov. 9, at one o'clock a. m., the large steam flouring and feed mills owned by H. L. Rowe, at Columbus, Pa., three miles east of Corry, were burned to the ground, causing a loss of \$15,000, with but \$4,000 insurance. The mills had been leased to A. W. Franel of the place for a term of five years. The stock on hand was light and his loss will not be over \$1,000; no insurance. The origin of the fire is unknown. The following in-

surance companies are represented in the loss; Fire Association of Philadelphia, \$1,500; Royal insurance company of Liverpool, \$1,500; Orient insurance company of Hartford, \$1,000.

According to experiments carefully made at Houghton Farm, N. Y., it seems that an exact bushel of corn is seldom sold. The standard bushel, 56 pounds, should be of dry grain, while the 56 pounds of harvest weighs, when dry, only 52 pounds, and when kept a few months sinks to 46 often, while corn varies in weight with the wet or dry condition of the weather. A yield of 100 bushels per acre by weight, say those who have studied the above experiment, weighed thirty days after husking, would show a great falling off in six months. About 65 pounds of new shelled corn, it was found, is required to make 50 pounds of dry corn.

The Canadian Pacific railway has an eye on the development of the grain export trade, and to that end the Montreal Terminal Company, an organization through which the big elevators in connection with the railway are to be erected, has been laid before the public. The capital of the company is fixed at \$500,000, one-half of which will be called up and employed in at once constructing two elevators of a capacity of 400,000 bushels each, so that they may be ready for use at the opening of navigation next year. The investment is secured by the railway company, which guarantees a dividend of 7 per cent., and undertakes to purchase the elevators at an advance of 5 per cent. on their cost after ten years, taking in the meantime a lease of the property.

George Van Name, and G. M. Stone, of Washington, D. C., have entered suit in the United States Circuit Court against Robert L. Downton and the Downton Manufacturing Company, of St. Louis, for infringement of patent rights. The complaint alleges that November 12, 1867, Stone patented a cylinder or roller-grinding mill. Afterward he assigned one-half interest to Van Name, and they have since remained undisturbed possession of their rights, etc., with the exception of the infringement of Downton. The damage is alleged to be \$250,000; they pray the Court to ascertain the real amount of damage and increase the amount three times on account of "willful and unjust infringement," and ask that an injunction be granted restraining the defendants from further manufacture of the mills.

"Vessel men are now more bitter against the Port Huron elevators," says the *Detroit Free Press*, "than against those in Detroit. It was bad enough to have shortages of forty and sixty bushels occur on a cargo from this port delivered at Buffalo, but when the shortages get into the hundreds, vessel men cannot find words to express their feelings. The last shortage that occurred on a Port Huron cargo, delivered at Buffalo, was that of the 'Lizzie A. Law.' The cargo of the vessel was weighed twice at Buffalo, and it was found that there was a shortage of 500 bushels, the largest that has occurred during the season. The cargo was obtained entirely at Port Huron, and the enormity of the shortage astounds vessel men generally. Nearly every vessel that has loaded this season at Port Huron has been deficient at Buffalo. It is certain that the fault is not at Buffalo, for before the cargoes, in several cases, have been received, the scales have been tested and found to be correct."

The report of the Missouri State Board of Agriculture from correspondents November 1, notes that a general disposition prevails to give more attention to grass and stock, and less to wheat, and the secretary suggests the belief that the same amount of wheat now grown could, under rotation of crops and better management, be grown on one-half the area now sown. Frequent rains in September and October have restricted the area sown in wheat, and the relative area sown is now placed at 90 per cent. The present condition of wheat is 96.3. The yield of corn is found to be 35.7 bushels per acre, making a total crop of 209,867,594 bushels, the largest ever grown in the state; quality, 96.8. Yield of tobacco per acre, 1,030 pounds; hemp, 967 pounds. The yield of potatoes per acre was 108 bushels, and the quality of some 107 per cent., showing a very good crop. Hog cholera appeared in 33 counties. There are about 40 creameries and cheese factories in the state. They have paid an average of 15.4 cents per gauge of cream, a gauge being regarded the equivalent of one pound of butter. The average number of cows to a factory is 308.

It would appear that the grain speculators in Chicago expect to buy Iowa, Kansas and Nebraska corn next spring for a mere song, says the *Iowa State Register*. They are contracting to deliver corn at Chicago next May at 39½ cents. This would allow the farmers of the three corn states named an average of twenty cents per bushel at the various railroad stations. The farmers have not the spirit and enterprise they ought to have if they ever submit to such starvation prices. Every

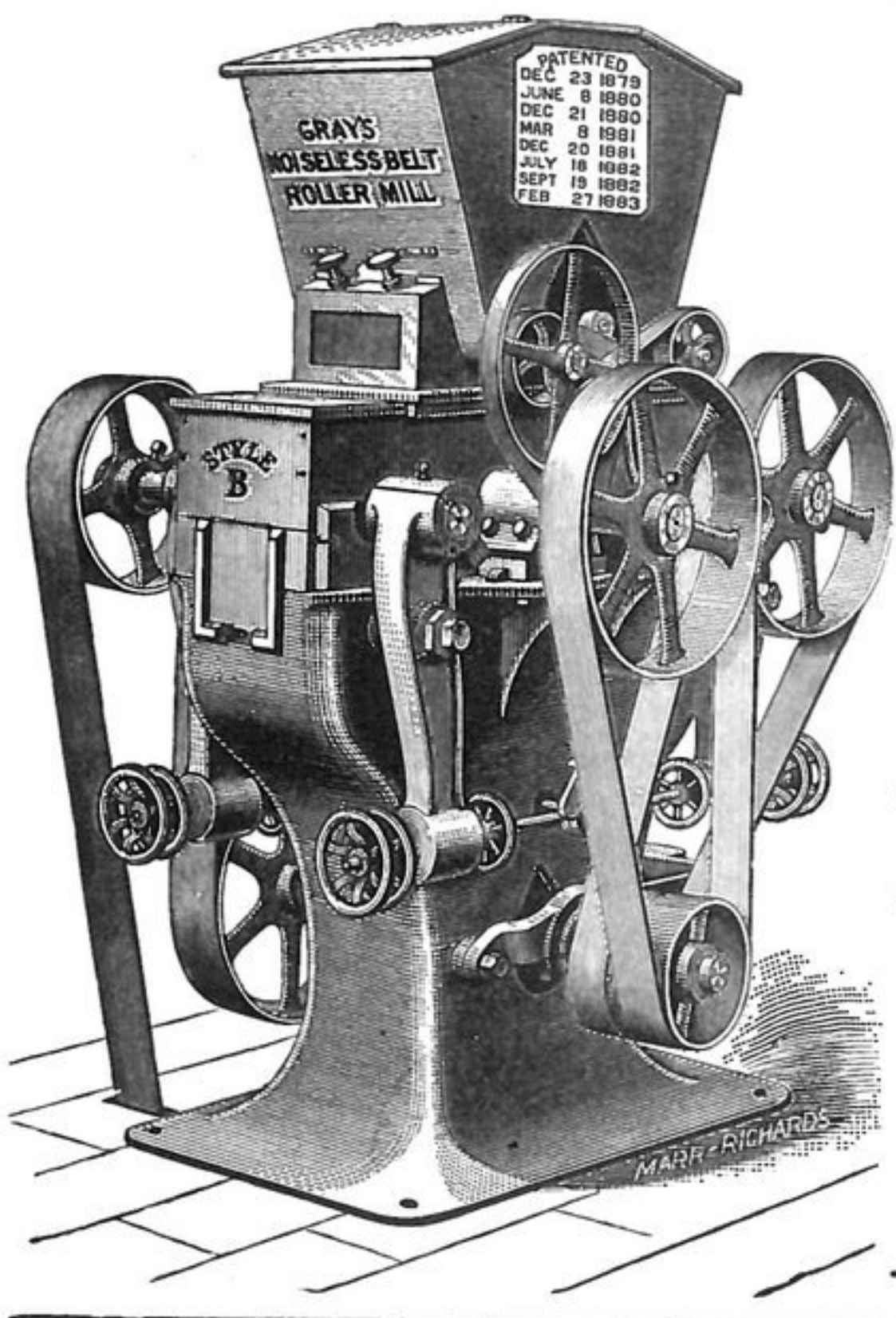
one of them should resolved at once not to sell a bushel at such prices. They have the remedy in their own hands, and they should block all branches of business, and nearly starve the world, before they submit to such prices. This would be disastrous business to trade and commerce but the gamblers in produce would be taught a lesson, no matter how great the consequences to regular business. No branch of industry should be controlled in the price of the product of their labor so as to keep them eternally the drudges of the world. Had we our way, gamblers, transportation companies, produce speculators and consumers should be brought to terms in three months.

The selling of the Mazeppa Mill Company's property on Nov. 6, was quite a notable event. The sale took place pursuant to a decree of the court that was published in the papers. Those present were Paul Hauser and Albert Scheffer, of St. Paul; Jesse McIntire, Mr. Pierce, of Pierce, Simmons & Co., W. H. Putnam, and C. H. Duryea, of Red Wing, and quite a large delegation of the citizens of Mazeppa. The sale commenced shortly after 11 a. m., Mr. Putnam acting as auctioneer. Mr. Pierce started the sale by bidding \$20,000, and Paul Hauser closed at \$28,100 for the mill property, including the cooper's stock, sacks, etc. This property was scheduled September 16, at \$157,871.72, and is now closed out at a shrinkage of \$129,761.72. The citizens of Mazeppa have a deep and abiding interest in the prosperity of whoever owns and operates this mill. It gives employment to quite a large number of men, besides 50,000 bushels of wheat will be brought here that would find a market elsewhere in the event of the mill lying idle. The confirmation of this sale by the court, which is a mere matter of form, was made Wednesday, Nov. 12, at Wabasha.

The Cummer Engine Co. report that the Jonathan Mills' Flour Dresser, manufactured by them is meeting with excellent success. They are selling a great many of them, and are receiving a large number of repeated orders. They are also quietly placing a number of the "Finch" rolls, which are regarded by those who have investigated them as a very superior roll. They have just been awarded the contract for the refrigerating plant for the brewery of Rothaher Bros. & Thomas, of Philadelphia. This comprises two of their improved refrigerating machines, two condensers, &c. They have also entered into contract with Henry Zeltner, of Morrisania, N. Y., for a large refrigerating plant including two machines, two condensers, one of their 67 horse power engines, etc., and have received an order for an engine of the same size from the Montgomery Milling Co., Montgomery, Mo. Among the recent shipments of the Cummer Engine Co., are the following: A 95 horse power engine for the flouring mills of Amos Bros., Syracuse, N. Y.; two engines, 67 horse power each, for the Citizens Electric Light Co., of Akron, O.; a 150 horse power engine for the Upton Mfg. Co., Port Huron, Mich., one of 170 horse power for the cotton mill of the Hadley Co., Holyoke, Mass.; an engine of 280 horse power for the railroad shops of the New York West Shore & Buffalo R. R. Co., at Frankfort, N. Y., and a 170 horse power engine for the cotton mills of W. H. Cherry & Co., Mountain Mills, Ala.

The inaccuracies attendant upon the weighing of grain at points of shipment have constituted a conspicuous evil for several years, and efforts have been made by both railroads and shippers to devise more practicable systems of weighing than those now generally in vogue. About four months ago the Lake Shore Company adopted a system by which grain is weighed in hopper scales. So satisfactory to Eastern dealers has it proven that twenty-nine prominent buyers in Boston and Portland and all other New England points have issued the following call for a reform in the matter of weighing grain: "Having had a long and unsatisfactory experience with track scale weights on grain purchased in Chicago, which have been made final by the Chicago Board of Trade, thereby cutting off from us all remedy for the collection of claims for shortage that accrue from improper weighing, we consider that, in view of such action by Chicago shippers, it is highly essential and important that weights should be based upon the greatest possible accuracy. It is plainly demonstrated that such can not be obtained by weighing cars, heavy and light, on track scales. Having learned that a new system of weighing grain has been adopted by the Lake Shore and Michigan Southern Railway Company, of Chicago, by which the grain only is weighed in hopper scales, we, the undersigned, buyers of grain in the Chicago market, hereby earnestly advocate the use and encouragement of any method that embodies accuracy in weights. We request that, as far as practicable, all our shipments of grain from Chicago be weighed in this way, and the cost of the same be provided for in the same manner as storage or other proper expenses."





## GRAY'S NOISELESS BELT ROLLER MILLS.

### STYLE "B" for SMALL MILLS

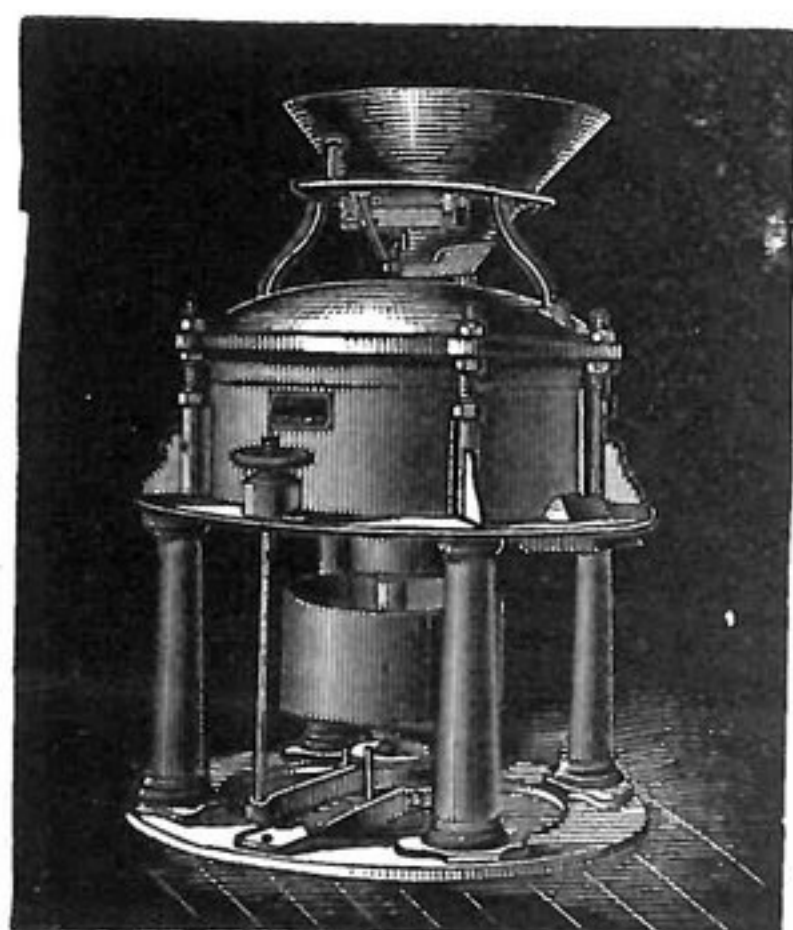
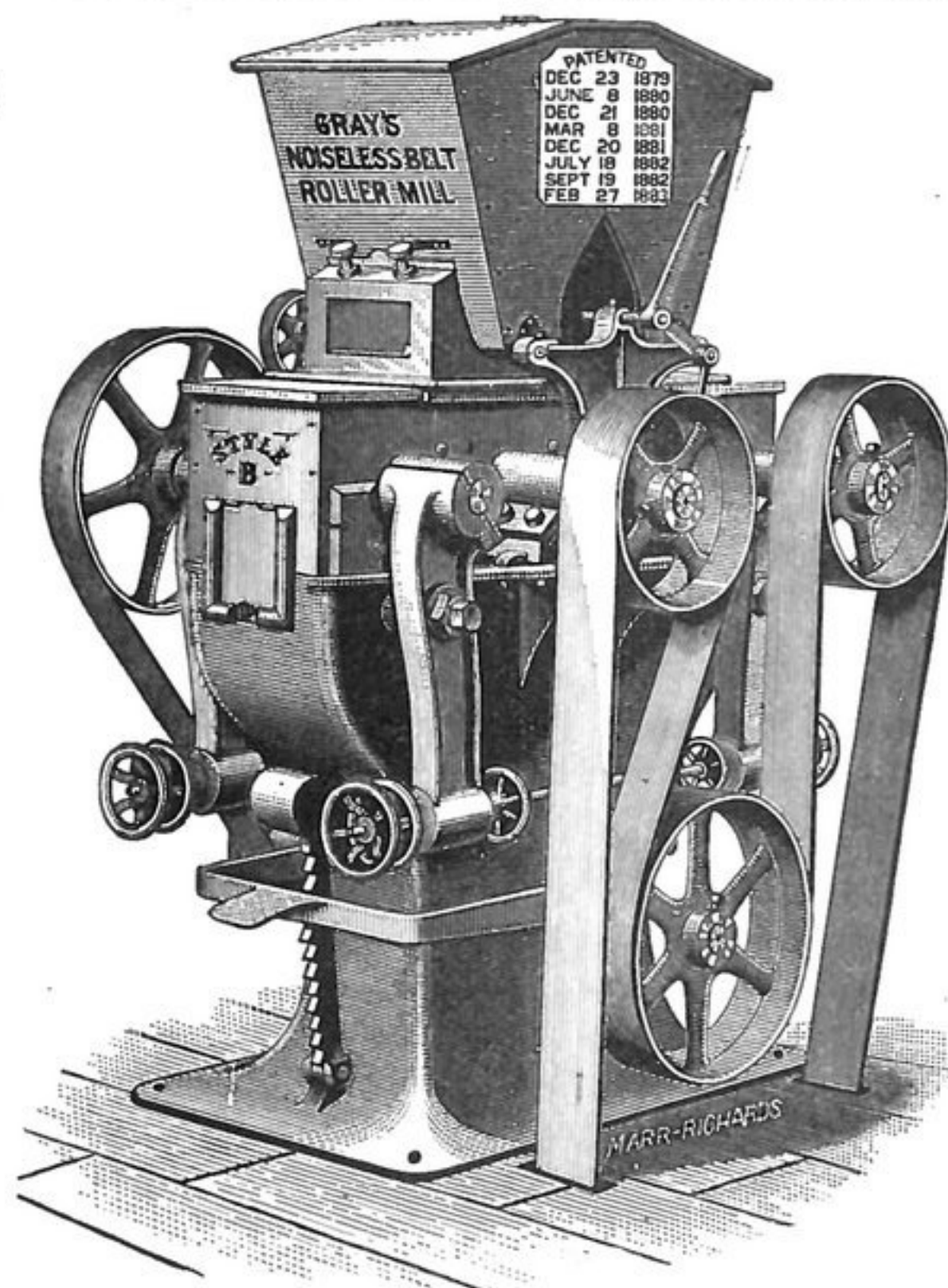
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**E. P. ALLIS & CO.**

SOLE MANUFACTURERS,

RELIANCE WORKS,

MILWAUKEE, . . WIS.



## MUNSON BROS. FOR ENGINES & BOILERS

MANUFACTURERS OF  
Munson's Celebrated Portable Mills,  
FOR WHEAT, MIDDINGS, CORN, FEED, Etc.  
Millstones, Hangings, Bolting Chests, Shafting,  
Gearing, Pulleys, Hangers, Etc.

DEALERS IN EVERY KIND OF

**MILLING MACHINERY,**  
ENGINES AND BOILERS, WATER WHEELS, Etc.  
**Genuine Dufour Bolting Cloth.**  
Specifications, Estimates and Plans furnished.

Address, **MUNSON BROS.**  
P. O. BOX 380. UTICA, N. Y.

## FOR ENGINES & BOILERS

*One to 30 Horse Power,*  
PRICE, FROM \$125 UPWARDS.

*Steam Pumps, - \$35 and up.*  
*Eclipse Tire Benders, 15 " "*  
*Fan Blowers, - - 18 " "*  
*Tuyere Irons, - - - \$2.50.*

THE BEST IN THE MARKET!

For Circulars, Etc., Address,

**THE LANCASTER STEAM PUMP CO.**

AND MACHINE WORKS,

EZRA F. LANDIS, PROPRIETOR, LANCASTER, PENN.

## THE BEST AND CHEAPEST COB CRUSHER

IN THE WORLD.

Steel Being Used in its Construction.

PRICE, 30.00.

RIGHT-HAND MILL.

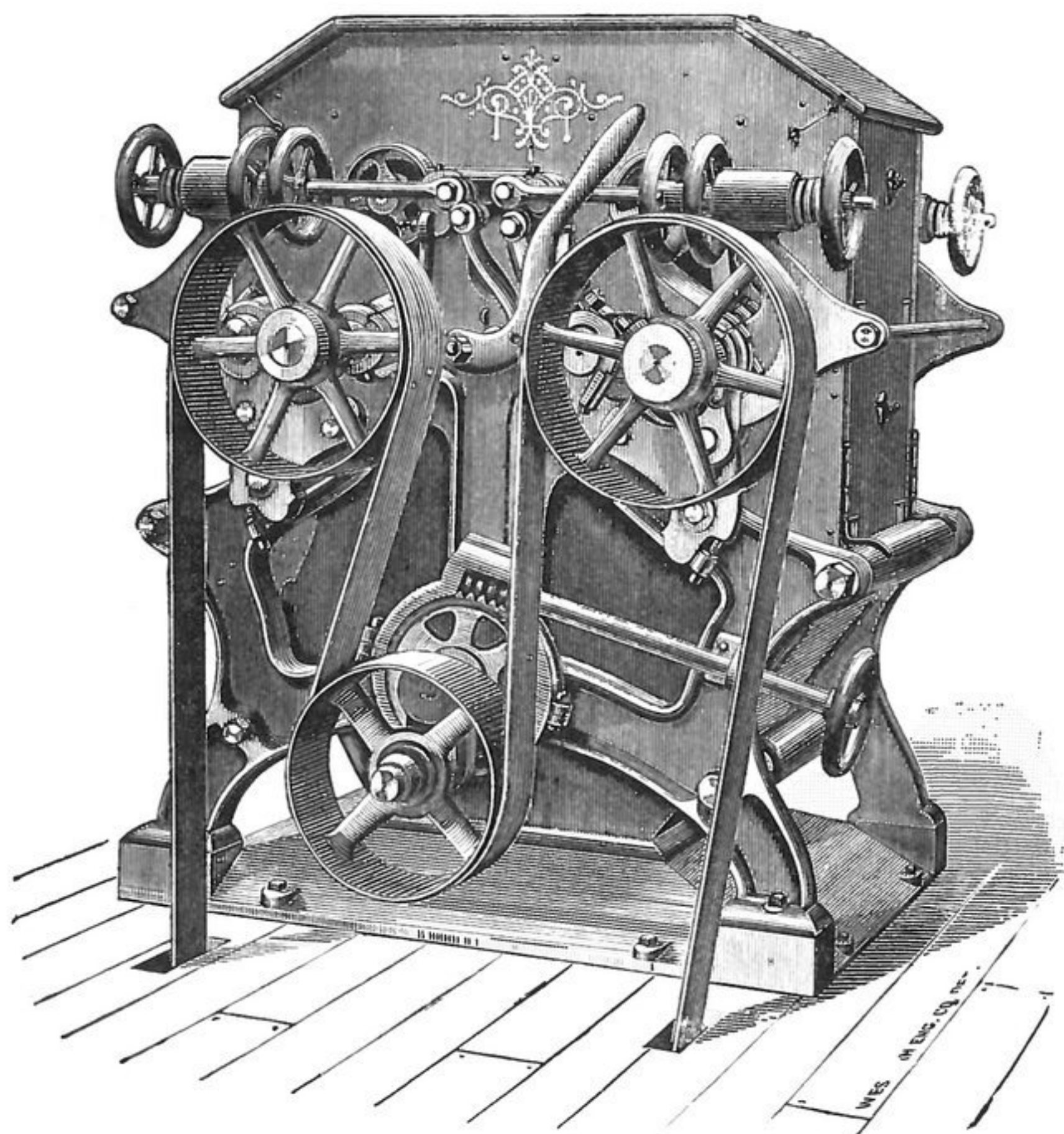
CAPACITY 75 BUSH. PER HOUR.

Thousands of these Crushers are now in use, and giving entire satisfaction.

Please Send for Circulars.



## The MILLER ROLLER MILL



Has no superior. Universal Tightener, Automatic Feed, Tight Base, Noiseless, with Non-Cutting Corrugations. We also manufacture the Rider Wheat Break, which has no equal for 1st, 2d and 3d Breaks. Send for Reference and Circulars of our Machines,

**THE MILLER CO., CANTON, O.**

## ODELL ROLLER MILLS

ARE MADE ONLY BY  
STILWELL & BIERCE MFG. CO., DAYTON, O.





## GRAIN TARIFFS.

THE "Koelnische Zeitung," one of the leading newspapers of Germany, contained recently a lengthy article on the tariff question, from which we translate the following: The grain tariffs occupy an important place in the programme of the present political campaign. In the south German press we find a strong tendency towards their increase, while in the northern part of the Empire a decided opposition to such measures is exhibited. In the most of these discussions the real causes are ignored, for the protectionists abuse all the principles of political economy and presuppose a lower stage of civilization than there really exists among those whom they address.

At a recent political meeting at Uebersheim, Baron von Loe stated "that the present wheat prices did not pay for the production, and that the assertion that increased tariffs meant increased bread prices for the people was all empty, idle talk." At another farmers meeting it was stated, "that an increase of 100 per cent of the grain tariffs were desirable, and could be accomplished without any disadvantage to the consumers, as the exporting countries had to pay the increase. Thus the German Empire would collect 38,000,000 marks instead of 19,000,000 and this would allow a corresponding reduction of taxes on real estate for the benefit of the commune."

If we review these assertions critically, we are forced to reject entirely the theory that an increase of 100 per cent. could be instituted without disadvantage to the consumer. The idea that the exporting countries pay our grain tariffs is based upon a conception so erroneous that it can exist only in the most fertile imagination. It is currently accepted that decreased demands have a depressing influence upon the prices, and that in this way a high tariff can decrease the demand for an article which is offered in limited quantities only, and in this way depress its market price by as much as the total amount of the tariff. It is very questionable, to say the least, that such results would attend the demand for grain, an article, the consumption of which is least elastic, and which forms a staple article of commerce in so many countries. And admitting even that the German grain tariffs did result in a lower price of grain at New York or Odessa, how can we demonstrate that this decrease of price benefitted the German importers exclusively, and not in a corresponding degree England and other countries who are without a tariff on grain? If merchants from free trade and from protected countries purchase grain on foreign markets for the same prices, then the merchant from the protected country can sell at no lower prices than that at which he bought, plus the tariff, and the grain prices must of necessity be higher there than in a country not protected by tariffs. This seems to be an indisputable fact. And furthermore, what good would the increased tariff be to the agriculturist, if it did not increase the grain prices. Some of the papers have already dropped the argument that the exporting countries have to pay the grain tariffs, and are now trying to convince their readers by an elaborate display of statistical figures that an increased price of grain has not always been followed by an increased price of bread, and that the two are entirely independent of each other. This seems to be a rather shallow argument.

It is well known that grain prices and bread prices do not always run parallel; the bread price depends, aside from the price of grain, upon the profit of the miller, the baker, and several middlemen; these

profits do not depend upon the price of the grain, but rise and fall with entirely different economic conditions. If labor is cheap and profits are small, the increase in the price of grain due to tariffs may be reduced, or even disappear entirely in the price of bread. This, of course, does not at all interfere with the supposition that the bread would have been correspondingly cheaper, if the grain prices had not been increased by a high protective tariff, and all attempts to prove that protection has no deleterious influence upon the prices of bread, are based upon false premises, and must result in failures.

## HARBOR OF ST. PETERSBURG.

A revolution in the commerce of St. Petersburg is expected from the completion of the new harbor of the Russian capital. The idea of Peter the Great to make a port at his new capital has been at last realized. It will be remembered that in order to enable the merchant vessels to reach St. Petersburg, the great ruler tried to cut a canal at the mouth of the Neva. Nearly two centuries have passed since then, and the Czar's capital has had no port until now. All the merchant steamers, ships and barks stopped at Kronstadt, thirty miles from the capital. Kronstadt being a naval port could not well afford accommodation for over a thousand merchant vessels per annum; and besides the transportation of goods from Kronstadt to St. Petersburg, the double unloading and other difficulties, entailed expenses amounting to from seven to ten million roubles per annum. Being connected with the Volga by three systems of canals, St. Petersburg was the natural entrepot for the Russian foreign trade and badly needed a port.

In 1872 Mr. Putiloff, a wealthy owner of iron works, selected a site for the port and connected it by a railroad with the principal railroad depot of St. Petersburg, but a ship canal was a necessity, for at the mouth of the Neva the water was only about eight feet deep. In 1877 the Russian Government commenced the canal which has only been recently finished. It passes through the four islands whose shape is greatly changed. These are the Cannoner's Island, the Volny, the Kerosene, and the Gutuevsky. The swamps along the canal were filled, and the place is prepared for the warehouses. The bed of the canal is designated by red and blue buoys.

The ceremony of the opening of the marine canal is postponed till the next spring, when the Czarina, in the presence of the Czar and the highest authorities, will cut the ribbon stretched across the canal, but the actual opening has already taken place in advance of the official ceremony. On Oct. 2 four men-of-war-ships passed through the canal from Kronstadt to the mouth of the Neva. The Novoe Vremia said on this occasion: "To-day a great event took place in our capital. For the first time since the foundation of our city, there appeared in our beautiful river, almost in the center of the capital, the huge marine steamers. The shade of Peter the Great should triumph to-day. Hence all the marine and naval vessels may be the guests of our capital."

The port of St. Petersburg will revolutionize both the home and foreign trade of Russia. The ship canal connecting it with the sea is seventeen and two-thirds miles long; its width varies from 210 feet at the St. Petersburg end to 350 at the Kronstadt entrance. The depth is the same throughout its length, viz., twenty-two feet. The amount of earth removed on the bed of the canal was 40,670,000 cubic feet, and the canal cost 13,000,000 roubles, not counting 4,000,000 roubles spent on the port proper.

## NOTES.

The whole of the machinery required for the erection of a large roller mill plant in Bombay, which will be the first mill on the new system

erected in the East Indies, has arrived out in Bombay safely.

The Chinese Government has applied, through Minister Young, for 3,000 square feet for its exhibit at the New Orleans Exposition. Director-General Burke has been written to upon the subject by the Department of State.

The export of Austria-Hungary to the United States for the three months ending Sept. 30, amounted to \$1,728,517, against \$2,022,636, in the corresponding period of the past year, a reduction of \$294,118. The export consisted of glassware, \$380,000, buttons, \$220,000, dried fruits, \$175,000; jewelry and fancy work, \$168,000; linen and cotton goods, \$138,000.

A bill has been introduced into the Congress of the Argentine Republic for the entire suppression of export duties, in view of the prosperous financial condition of the country. The abolition of export duties would give a powerful stimulus to the productive resources of the Republic, and would enable the Argentines to enter the consuming markets of the world on advantageous terms.

The quantity of wheat on passage for France Oct. 24, 1884, was 63,200 bushels by sailers and 480,000 bushels by steamers, making a total of 543,200 bushels against 1,000,000 bushels at the corresponding date in 1883. The net imports of wheat and flour into France during the two months ended Sept. 30, 1884, were 7,560,000 bushels against 7,632,000 bushels the corresponding period in 1883.

The circulation of false reports on the produce exchange at Berlin has been carried on to such an extent of late, that official action was considered necessary, and the first member convicted of the offence was sentenced by the Executive Committee of the exchange to "suspension" for one month. If the example does not exert a healthy check upon the evil practice, we are told, more severe measures will be administered.

A movement is on foot to form a Millers' Association for the Australian Colonies under the name of "Australasian," embracing the seven Australian Colonies and New Zealand, although separate organizations may be formed. The total number of mills is 573, the largest number being in New South Wales, 150, and 139 and 102 respectively in Victoria and New Zealand. The pairs of millstones returned for the four colonies were 1,011, of which Victoria has 439.

The *Millers Gazette* brings a catalogue of the number of roller mills manufactured by Ganz & Co. at Budapest and in operation in the different countries up to September 30: Hungary, 1971; Austria, 2539; Germany, 1865; Russia, 1783; Italy, 437; Switzerland, 237; France, 576; Belgium, 280; England, 367; Spain, 163; Roumania, 162; America, 200; Holland, 87; Denmark, 58; Norway, and Sweden, 70; Bulgaria, Turkey, Greece, Egypt, 47; Australia, 81; India, 8; total 10,951. During the past five months an average of 170 mills was sold per month.

The fire engines in Italian cities are still the same little hand-pumps used in the beginning of this century; not a single steam fire engine exists on the peninsula, owing to the rarity of fires, but a movement is now on foot to introduce steam engines, according to the American style. "The next step in the grand march of civilization in Italy, evidences of which on every side are so deeply deplored by many tourists, will be to erect buildings on the combustible American plan, so as to enable the gallant firemen to practice occasionally with their steam engines," remarks an American journal.

The Russian grain exports have almost come to a standstill, according to German journals, the principal cause of which is said to be the increasing competition of America. So we are told that the stock on hand of Russian wheat at Danzig, Prussia, amounts to 18,000,000 bushels and there is less shipment of grain on the river Weichsel during this year than was ever known before. Russian grain producers suffer severely from these conditions and the grain speculators of Danzig, who, in years past, advanced considerable sums of money on Russian wheat, refuse to give any credit now and prefer to purchase American grain.

The South Australian *Chronicle* of Sept. 6th says: On Saturday there was a north wind, such as in September, 1882, reduced the wheat yield several bushels; and it was feared by some people, not without reason, that our experience would be even worse than in the season of 1882-3. In fact this season seemed to combine that of 1876, when July and August were dry, and the season of 1882, when the September hot winds to a great extent destroyed the promise of the crops that had been sustained by a moderate rainfall during the winter months. But last Saturday was succeeded by a Sunday, and since then light showers have fallen. The crops are not safe, but they are not in such deadly danger as they were at the end of last week. The farmers have had a reprieve, though their

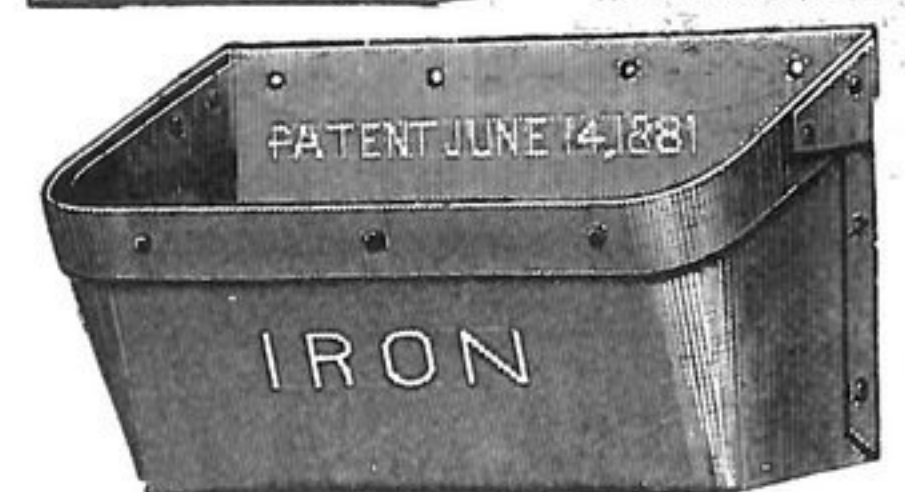
fate is not decided yet. It is to be feared that it is yet too late to expect an eight bushel harvest, but good rains even now might produce an average yield of six or seven bushels per acre. In New South Wales the rain-fall has given the crops a good start.

The bulletin published by the Russian ministry of finance gives some interesting information about the agricultural and commercial condition of Western Siberia. The central region of the Obi and the Irtisch is noted for its magnificent pasturages and corn-fields, the latter yielding 2,200,000 tchetverts of grain in an average year. The wandering Kirghese tribes excel in the raising of stock, and upon the steppes bordering upon the Irtisch there are 1,200,000 head of cattle. There are a great many manufactures in the country, and they supply nearly the whole of western Siberia. Upon the other hand, the lower course of these two rivers offers a striking contrast. Even as far up as seven hundred miles from its mouth the Obi is from one to two miles broad, and toward the mouth itself it is as much as thirty miles across. The banks become more and more thinly inhabited, vast marshy plains extending out towards the sea, inhabited by a few nomad tribes. The climate in this region is very severe, and during the winter, which lasts from September until May, the snow storms are terrible in their effects. The ice does not generally break up before the latter part of June, and the summer is cold and rainy. The sedentary part of the population earn their living by fishing and shooting, and in the vicinity of Tomsk and Tobolsk the fish, which is taken in large quantities, is frozen and sent off to Russia. The inhabitants have for a long period done very well with the game which they have killed, but of late years such a vast area of forest has been cleared, that game of all kinds is much less abundant than it was.

## THE BOSS ELEVATOR CUP



is gaining favor every day. Over 13,000 sold in one day in three different States. My capacity in my new shops is 6,000 per week. I carry 30,000 cups in stock and can take care of any size order.  
W. P. MYER,  
19 and 21 E. South St.  
INDIANAPOLIS, IND.



**Automatic Cut-off ENGINES**  
Embodying a New System of Regulation.  
THE GOVERNOR WEIGHS THE LOAD. The most perfect governing ever obtained. Send for circular D.  
BALL ENGINE CO.  
EBER, PA. WE GUARANTEE better regulation than it is possible for any other ENGINE to give.

**RIVAL STEAM PUMPS**  
THE CHEAPEST AND THE BEST FOR HOT & COLD WATER. \$35.00 AND UPWARDS. SEND FOR CATALOGUE.  
15 SIZES MANUFACTURED BY JOHN H. MCGOWAN & CO. CINCINNATI

## Toledo Mill Picks and Stone Tool Mfg. Co.

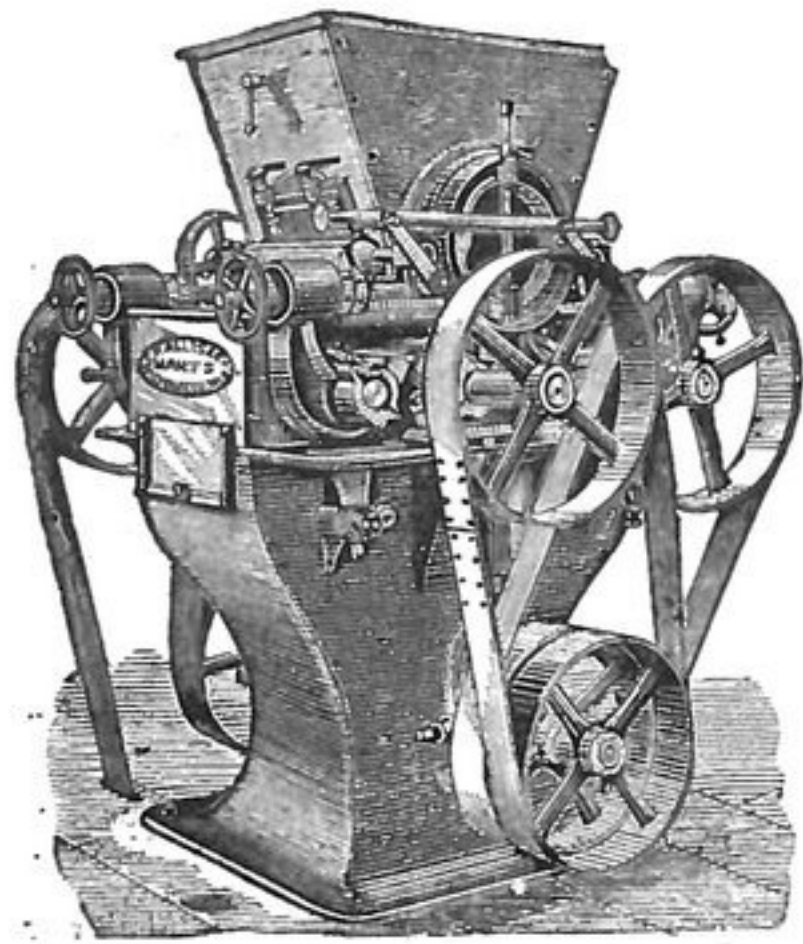


## Manufacturer and Dresser of Mill Picks.

Made of the very best double-refined English cast steel. All work guaranteed. For terms and warranty, address GEO. W. HEARTLEY, No. 297 St. Clair Street, Toledo, O. Send for Circular.  
N. B.—All Mill Picks ground and ready for use (both old and new) before leaving the shop. No time and money lost grinding rough and newly dressed Picks. All come to hand ready for use.

ALSO MANUFACTURERS OF  
SHAFTING, PULLEYS, HANGERS, COUPLING  
AND MACHINE JOBBING.



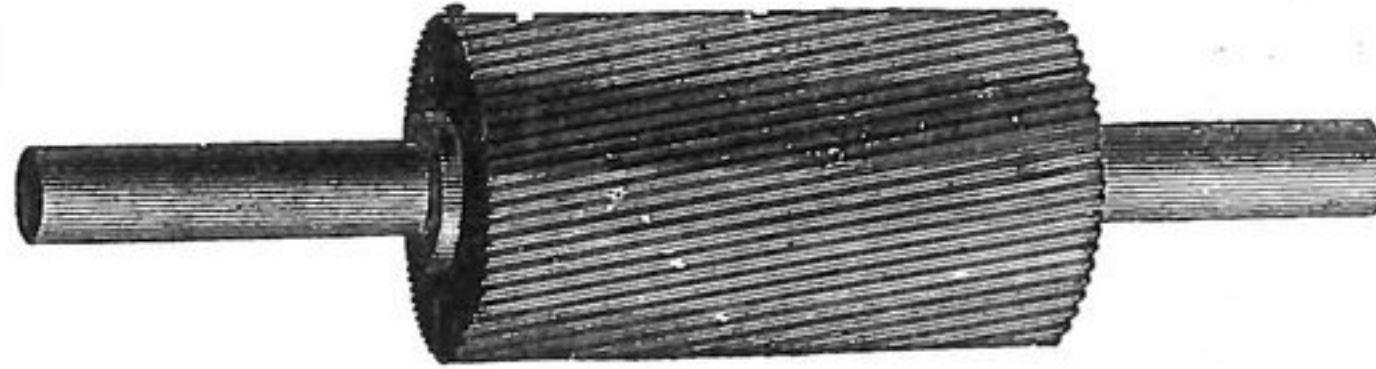


# THE BRADFORD MILL CO.

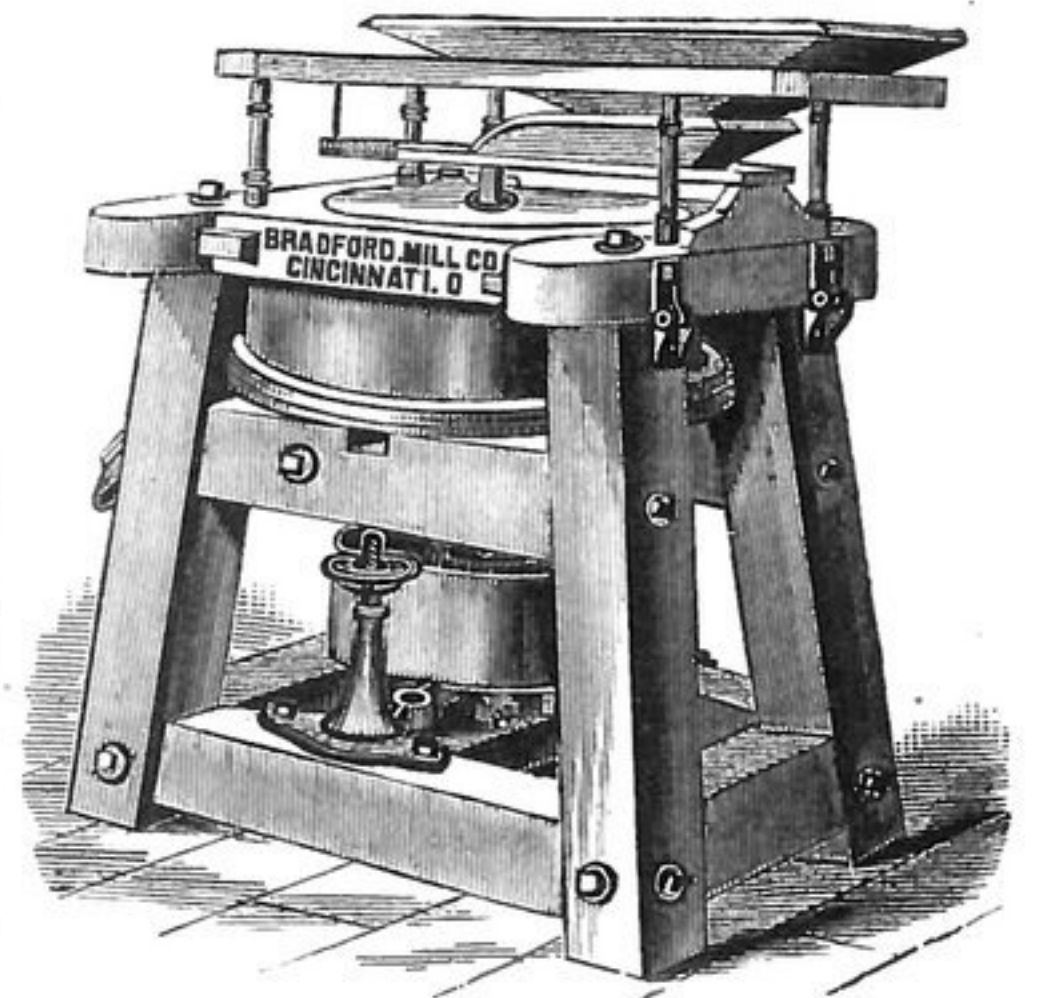
Manufacture a Complete Line of  
FLOUR MILL MACHINERY,  
Including Portable Corn and Middlings Mills.

## RE-GRINDING AND RE-CORRUGATING

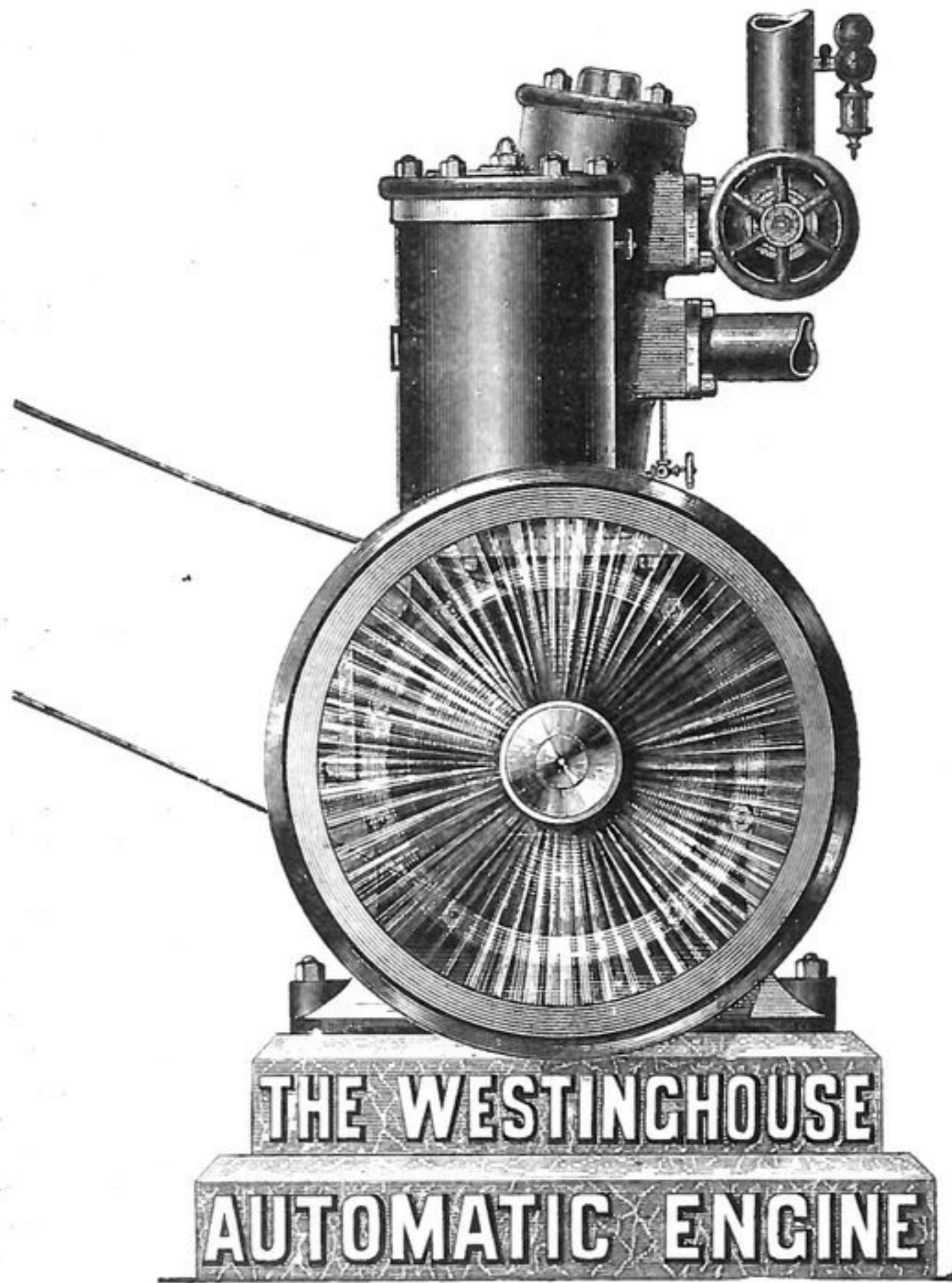
PORCELAIN  
ROLLS  
RE-GROUND.



CHILLED IRON  
ROLLS  
Re-Ground and  
Re-Corrugated.



EIGHTH AND EVANS STREETS, - CINCINNATI, OHIO.



### SALES FOR OCTOBER, 1884.

	H. P.		H. P.
O. F. B. Barber, Flouring Mill..... Golden, Col.	75	Lawrence Machine Shop, (2d order) Lawrence,	25
Kenyon & Newton, Planing Mill..... Brooklyn, L. I.	75	Mass.....	
U. S. Illuminating Co..... Charleston, S. C.	60	Lombard, Ayres & Co., Saw Mill, (3d order) Mo-	20
" " (2d order).....	60	bile, Ala.....	20
" " (3d order).....	60	H. W. Jones, Ginning..... Row Landing, La	20
" " (4th order).....	60	Kingsland, Jackson & Co. Machinists, Chicago, Ill.	15
" " (5th order).....	60	J. Christman, Elevator..... Stewartsville, Mo.	15
Toledo Electric Co..... Toledo, Ohio.	60	Bell Bros., Flour Mill..... Osage, Iowa.	15
Thompson-Houston Etc. Lt. Co..... Quincy, Ill.	60	Fred Hanson..... Eau Claire, Wis.	15
" " (2d order).....	60	G. B. Shaw, Elevator..... Kansas City, Mo	15
Thompson-Houston Etc. Lt. Co. Philadelphia, Pa.	50	" " (2d order).....	15
Consumers Gas, Fuel and Light Co... Chicago, Ill.	45	Stoutz & Co., Planing Mill..... Mobile, Ala.	15
J. M. Gusk, Electric Light..... Pittsburgh, Pa.	45	T. G. Cansler, Ginning..... Itaska, Texas.	15
Himebaugh & Merriam, Eltrc. Light, Omaha, Neb.	45	H. Hartmann..... Ash Hill, Mo.	15
Chas. Aubert, Irrigation..... Port Allen, La.	40	J. Greenlaw, Ginning..... Calvert, Texas.	15
Susquehanna Water Power & Paper Co. Conowingo,	35	Shutte & Co., Planing Mill..... Pittsburgh, Pa.	15
Md.....	35	A. M. Good & Bro., Saw Mill... Waynesboro, Pa.	15
C. H. Klemar, Woolen Mill..... Faribault, Minn.	35	Herman Fletcher..... Louisville, Ky	12
The "Battle House," Electric Light. Mobile, Ala.	35	Worcester Gas Light Co..... Worcester, Mass.	8
Hastings Electric Light Co..... Hastings, Neb.	35	Anderson & Barr..... Philadelphia, Pa.	8
" " (2d order).....	35	Thompson-Houston Electric Light Co., (3d order)	8
O. W. Butts, Packing House..... Kansas City, Mo.	35	St. Louis, Mo.....	8
Morris Butt & Co.....	35	W. C. Kerr & Co., Yacht Engine..... New York.	8
Lowell M. Palmer, Paper Mill..... Brooklyn, L. I.	35	" " (2d order).....	8
Smith & James, Saw and Flour Mill, Columbia, Mo.	35	H. L. Howe, Fan Blower..... Canandigua, N. Y.	8
E. B. Ward, Ginning..... Plainview, N. C.	30	Ed. Lehda, Tea Store..... New Orleans, La.	4
W. W. Pugh, Draining..... Home Place, La.	30	R. H. Nevins, Ice Factory..... Mayo, Fla.	4
J. Lepayre, Irrigation..... Bayou Goula, La.	30	F. Plump, Ditching..... Streator, Ill.	4
Baltimore & Ohio R. R. Shops..... Columbus, Ohio.	25	" " (11th order).....	4
G. W. Young, Ginning..... Honey Grove, Texas.	25	" " (12th order).....	4
Harvey Miller, Nickel Plater... Cincinnati, Ohio.	25	Steamer "Big Sandy," Eltrc. Light, Cincinnati, O.	4
Timothy Vinton, Paper Mill..... Brattleboro, Vt.	25		
		Total, Fifty-eight Engines.....	1,685

Besides the above, nineteen engines were purchased by our various agents for general stock, making a total sale of seventy-seven for the month. We are now enlarging our Works to a capacity of 100 Engines per month, or four Engines per working day.

In view of the universal stagnation of Trade, we would candidly ask if the above List is not conclusive as to the standing of the Westinghouse Automatic Engine?

SEND FOR ILLUSTRATED CIRCULAR AND REFERENCE LIST.

**The Westinghouse Machine Co.**  
PITTSBURGH, PA.

Sales Department Conducted By

WESTINGHOUSE, CHURCH, KERR & CO., 17 Courtland Street, New York.  
FAIRBANKS, MORSE & CO., Chicago, Cincinnati, Cleveland, Louisville and St. Paul.  
FAIRBANKS, & CO., St. Louis, Indianapolis and Denver.  
PARKE & LACY, San Francisco and Portland, Oregon.  
PARKE, LACY & CO., Salt Lake City, Utah.  
IMRAY, HIRSCH & KAEPPLE, Sydney and Melbourne Australia.

## CASE HAS A SPLENDID FEED

THIS IS UNIVERSALLY ADMITTED.

It Never Fails to Spread the Entire Length of the Roll.

It Cuts Itself Off Before the Roll Stops.

It Does not Begin to Feed Until the Roll is in Motion.

It Feeds Every Class of Stock With Equal Uniformity

It Requires No Attention From One Year's End to the Other.

It Makes a Uniform Product and Reduces the Low Grade.

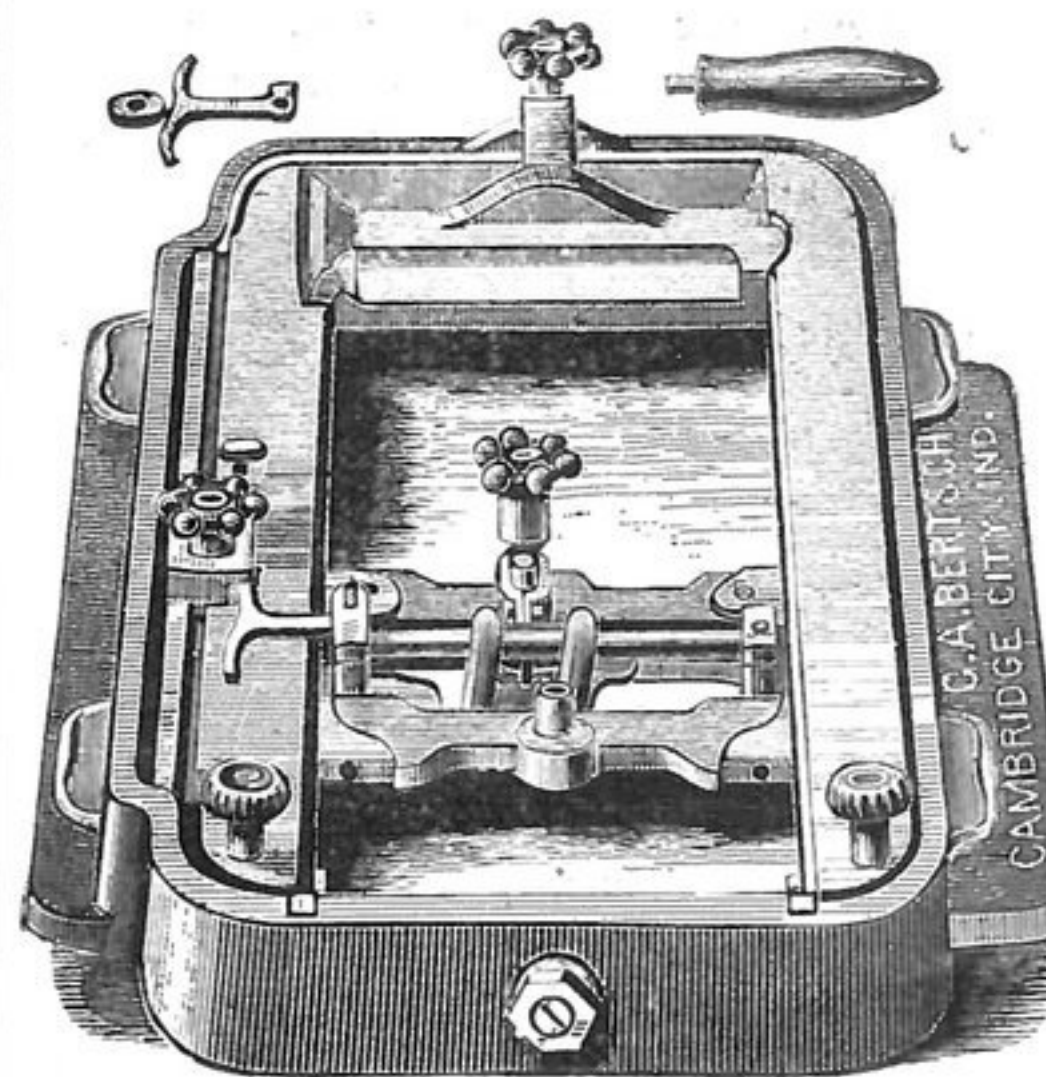
This important element of our Rolls and Purifiers is being infringed by others. We own and control exclusively under a large number of patents, this VIBRATORY FEED, and it has become necessary for us to notify the millers that we are about to enter suit against all parties infringing our rights. Write us for low prices on Rolls, Purifiers, Centrifugal Reels, &c.

ADDRESS,

**THE CASE MFG. CO.,**  
COLUMBUS, OHIO.

**GOVERNORS** { For Water Wheels } Cohoes Iron Foundry and Mch. Co.  
Send for Catalogue. Cohoes, N. Y.

## Teetor's Patent Quick Adjustable Diamond Dresser



The A Machine. 29 inches long, 18 inches wide. Weight, 145 pounds. Same width carriage as the B machine.  
The B Machine. 33 inches long, 19 inches wide. Weight, 170 pounds.

A revolution. No Screw Feed, no Ratchet Wheel, Paul Springs or extra Fixtures to contend with. A complete Machine warranted to be much the best and most complete Dresser in the world, will guarantee better satisfaction than any other of its class. Also that more work can be accomplished with less trouble and expense, or otherwise subject to be returned. The best of references given. Machines have been in use over four (4) years, and there has never been a call for any repairs for any machine in use. Parties are surprised as to the merit and simplicity of the machine, and say it is a revolution compared with others. Also as to adjustments which are all accomplished quick and easily by hand without the use of any tool. A positive feed which is similar to a friction feed, the only practical feed ever invented for a diamond dresser feed; is instantly reversed to cut right or left while in motion, also to cut fine or coarse. Can cut over one thousand cuts per inch. Consequently can do much deeper facing especially with a dull diamond once going over with one or two diamonds. By finer feeding while in motion, need not raise the diamond on account of a raise or hard spot on the face, in which case it will cut an even depth, also when the diamond is fed to either side of carriage, as it is so constructed. In this so many fail. The machine is ample wide so as to set over the spindle. All the feed mechanism is hardened steel. All the wear can be taken up. Specially warranted as represented. State size of burrs. Circulars giving full description forwarded.

**C. A. BERTSCH,**  
CAMBRIDGE CITY, IND.



HAS BEEN AWARDED  
FIRST AND ONLY PREMIUM  
AT THE  
Millers' International Exhibition.



Office of THE MILLING WORLD.

Buffalo, N. Y., Nov. 19, 1884.

Indications are daily becoming stronger that wheat values have touched their lowest level, but how soon advance will set in is problematical. The low price is, however, continually causing comment, and the adage that a fat summer and fall makes a lean spring may, as many believe it will, have full demonstration in the future course of the market; four months of the crop heard from and the eight remaining months full of bullish possibilities, with the price of wheat now about 80c (November wheat closes at 79½c and December at 80½c). A good many level headed traders are putting themselves on record as long holders and bulls at the present prices.

There is some accumulation going on in the medium and high grades of flour, and this leads to some weakness in the market, demand being small and buyers acting as if they would not increase their takings until they got the signal from the course of the wheat market, which is now suggesting no reason for uneasiness as to the chances of replenishing assortments as required. The low grades of flour continue to be firm, and without quotable change, while the better qualities show irregularity and weakness. Exporters are showing but little concern, and report their orders few in number and out of working limits. The market for rye flour is firmly held at former prices, with receipts and stocks still small, and demand fair. Buckwheat flour is in moderate demand and more freely offered, without change of consequence in prices. There is a slow market for all kinds of corn goods, but stocks are too small for anything less than a steady market. The offerings of mill feed are liberal, but the demand is fairly active, and former prices are current.

#### BUFFALO MARKETS.

FLOUR—City ground clear Northern Pacific spring \$4.50@5.00; straight Northern Pacific spring, \$5.00@5.50; amber, \$5.00@5.15; white winter, \$4.75@5.25; new process, \$6.00@6.50; Graham flour, \$4.00@5.00. Western straight Minnesota bakers, \$1.75@5.00; clear do, \$4.50@5.00; white winter, \$4.75@5.00; new process, \$6.00@6.50; low grade flour, \$2.50@4.00. OATMEAL—Ingersoll \$5.75; Bannerman's \$6.00; Akron \$6.25. CORNMEAL—Coarse, \$1.00; fine, \$1.10 per cwt. RYE FLOUR—In fair demand \$4.00@4.25. WHEAT—Weak. Sales 20,000 bu. v. o. 1 hard Northern Pacific at 75c, cash, and 25,000 bu. do at 75c, to arrive. For No. 1 hard, at the Call Board, 80½c asked cash, 81c asked Dec., 80½c asked year. No. 1 red winter offered at 83c, and No. 1 white do at 81½c. CORN—Quiet. Sale 2,300 bu. special bin at 40½c, and one car-load new high mixed at 40c. OATS—No. 2 white 31½@32c; mixed Western 20@30c. State from wagons 32@34c. BARLEY—Demand fair. Sales fifteen car-loads No. 3 Nebraska at 75c, five do extra No. 2 Canadian at 76c, and two do extra No. 2 State at 70c, all on track. RYE—Western nominal at 57@58c.

#### FOREIGN EXCHANGE.

Fairly active and steady, commercial bills still being scarce for the time of the year. Posted rates closed at 4.81@4.81½ for 60 days' and 4.85@5.85½ for demand. The actual rates ranged: At 60 day's sight, 4.80¼@4.80½; demand, 4.84½@4.85½; cables, 4.84¾@4.85¼, and commercial, 4.78¾@4.79. Continental exchange dull, but steady; francs, 5.25½ and 5.25 and 5.22½@5.21½; reichsmarks, 94¼@94½ and 94½@95; guilders, 39½ and 40½. The closing posted rates were as follows:

	60 days.	30 days.
London	4 81½	4 85½
Paris francs	5 28¾	5 20½
Geneva	5 28¾	5 20
Berlin, reichsmarks	94½	95½
Amsterdam, guilders	40	40½

#### BUFFALO WHEAT MARKET.

Buffalo, Nov. 19, 1884.

Our wheat market the past week has been quite active, and buyers think that the bottom price has been reached. There have been large sales of Duluth wheat the past few days to our local millers, and for interior state trade; there has also been a good demand for export market. Prices have ruled steady though we notice the grade is not quite up to standard. No. 1 hard sold yesterday at 80c, red winter offered at 83; No. 2 red at 80@79¼. Corn in good demand for carloads and offered at 48c; No. 3 45½. New high mixed very fine sold at 49c. Oats offered on track at 31½ for No. 2 white.

JAMES S. MCGOWAN & SON.

## DUFOUR & CO.'S CELEBRATED BOLTING CLOTH.

#### NOTES.

The Case Mfg. Co., Columbus, O., have an additional order from A. Camingo, Pleasant Hill, Mo., for two pairs of rolls with patent automatic feed.

The Case Mfg. Co., Columbus, O., have an order from Lenoir Mfg. Co., Lenoir, Tenn., for two automatic feeds for their purifiers.

There is being built, and now almost completed, a very extensive experimental flour mill, in the vicinity of the Geo. T. Smith Middlings Purifier Co.'s works. The parties engaged in its erection expect to have it in running order about the first of February next.

#### COLLAPSE OF ENGLISH WHEAT GROWING

The *Farmers' Tribune* has, with some persistency, endeavored to show that the low price of wheat, far from being a permanent blow to the Northwest, is in reality a blessing in very thin disguise. It says: Low prices like the present, mean that the cheaper and newer lands, and the lands not equally well adapted for the production of other commodities, are to become continually larger sources of the world's supply. The world must and will have wheat, and it cannot have it unless under temporary and unusual circumstances, without paying a good profit above the cost of production. But in the older countries, and in the older portion of this country, wheat is henceforth to be a crop which cannot be grown with profit, or which will be much less profitable than other crops for which the soil is as well as or even better adapted. The immediate consequence is to be seen in the reduction of acreage, and this will have its most marked beginning in England. The average cost in England of raising a bushel of wheat is given by so high an authority as the *London Economist* as follows:

Rent, taxes, etc.	\$19.00
Carting and spreading manure	2.50
Plowing, drilling and harrowing	3.75
Seed, including preparation	2.50
Keeping rooks off	50
Hoeing and weeding	2.50
Harvesting and thatching	5.00
Threshing and carting out	2.50
Wear and tear of implements	75
Interest on capital, expenses, etc.	5.00
Manures	5.00
Total expenses	\$40.60
Receipts—Four quarters at \$7.50 each	30.00
Loss per acre	\$10.60

From this it appears that the English wheat-grower who sells his product on this fall's market loses 25 per cent., or \$10 per acre. And were it not for the high average yield of England—more than thirty bushels to the acre—the loss, of course, would be much greater. The farmer of Minnesota or Dakota can produce an acre of wheat at a total cost of from \$6 to \$8 per acre. Right in these figures lies the reason for firm faith in the future of the Northwest. England is about to retire from wheat growing, and her demand for foreign breadstuffs will be doubled within a decade. Meat, poultry, fruit and vegetables will be the future products of British farms. England is destined to become a great market garden. The transition must inevitably have come; but it has been precipitated by this year's phenomenal prices. No part of the world is so advantageously situated for a command of the future wheat market of Europe, as the north-western portion of the United States.

#### ENGLAND AND WHEAT GROWING.

It has been frequently stated that wheat was an unprofitable crop for English farmers, and figures showing cost of production and revenue derived from its culture have been freely presented to demonstrate that it was but a matter of short time before it would form an insignificant feature of England's agricultural products; indeed, it has been known that during the past ten years the area of lands devoted to this crop has been measurably curtailed. Prevailing low prices for wheat has brought this matter again prominently forward, and in its monthly review of the state and prospects of the corn and flour trades, our English contemporary, *The Miller*, says: That the English farmer, with nineteenth century wants and burdens, should continue living on fourteenth century prices and profits is an impossibility. And yet wheat remains one of England's leading

products, the annual yield of which, even at present prices, does not fall far short of £20,000,000 in value.

The abandonment of the wheat growing industry in England would be one of the most momentous events of modern times, yet we seem to be within measurable distance of such an event. The idea that a large acreage, particularly in the Eastern Counties, is only fit to grow wheat has been thoroughly exploded, and the farmer, be he west countryman or east countryman, is already learning that there are profitable crop rotations in which wheat has no place. The farmer now-a-days has only to specify the soil, the locality, and the drainage of his farm, and Dr. Voelcker or Mr. Dyer or Professor Jamieson, or the analyst of his county club—if the club be sensible enough to have an analyst—will be able to give him a scheme of rotation of crops from which wheat is entirely excluded, without what we may call the chemical balance of power being disarranged or overthrown. The increase of stock-keeping appears likely to be steady and important even in the so-called arable counties. Good food for stock can be grown even in dry counties. The system of ensilage is making an astonishing advance, and Mr. Woods' experiments in growing green maize for stock have startled us with the prospect of a new crop in the corn lands, for maize does well in comparatively dry soils, and yields heaviest in those years when turnips and roots are likely to be under an average production.

Briefly, it may be said that English farmers have for some few years perceived the desperate character of wheat growing, but that now they are perceiving more—they are at last beginning to see their way out of wheat growing. In Ireland wheat cultivation has gone down 25 per cent. in a single year, and millers must face the chance of a similar decline in Great Britain.

And for millers the outlook is very certainly a serious one. So large a proportion of American wheat is now sent us in the form of flour, that an extensive dependence on the United States is a matter which English millers are gravely concerned to prevent. The loss on the offal, screenings, &c., is a general loss to England and English trade; the loss on the manufacture of the wheat into flour is a particular loss to English millers and the English milling trade. From India we still receive the wheat entirely in an unmanufactured form, but the large receipts of Australian flour coming by the Suez Canal have given us a warning that the shipment of flour by vessels which must pass through the tropics is by no means impossible. If Australian flour can reach us cool and good, the flour of any country may reach us in the same condition.

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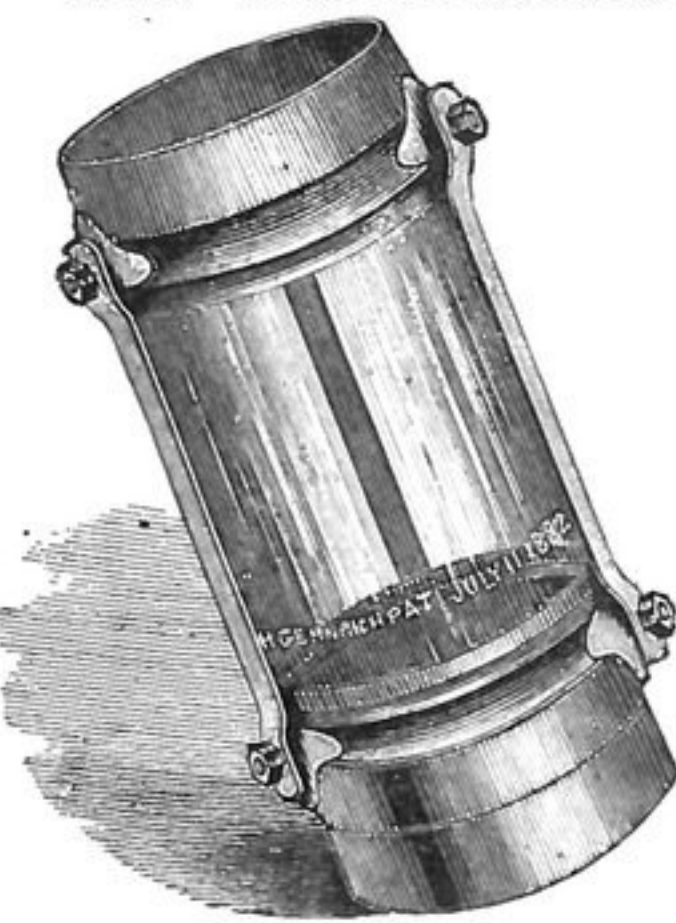
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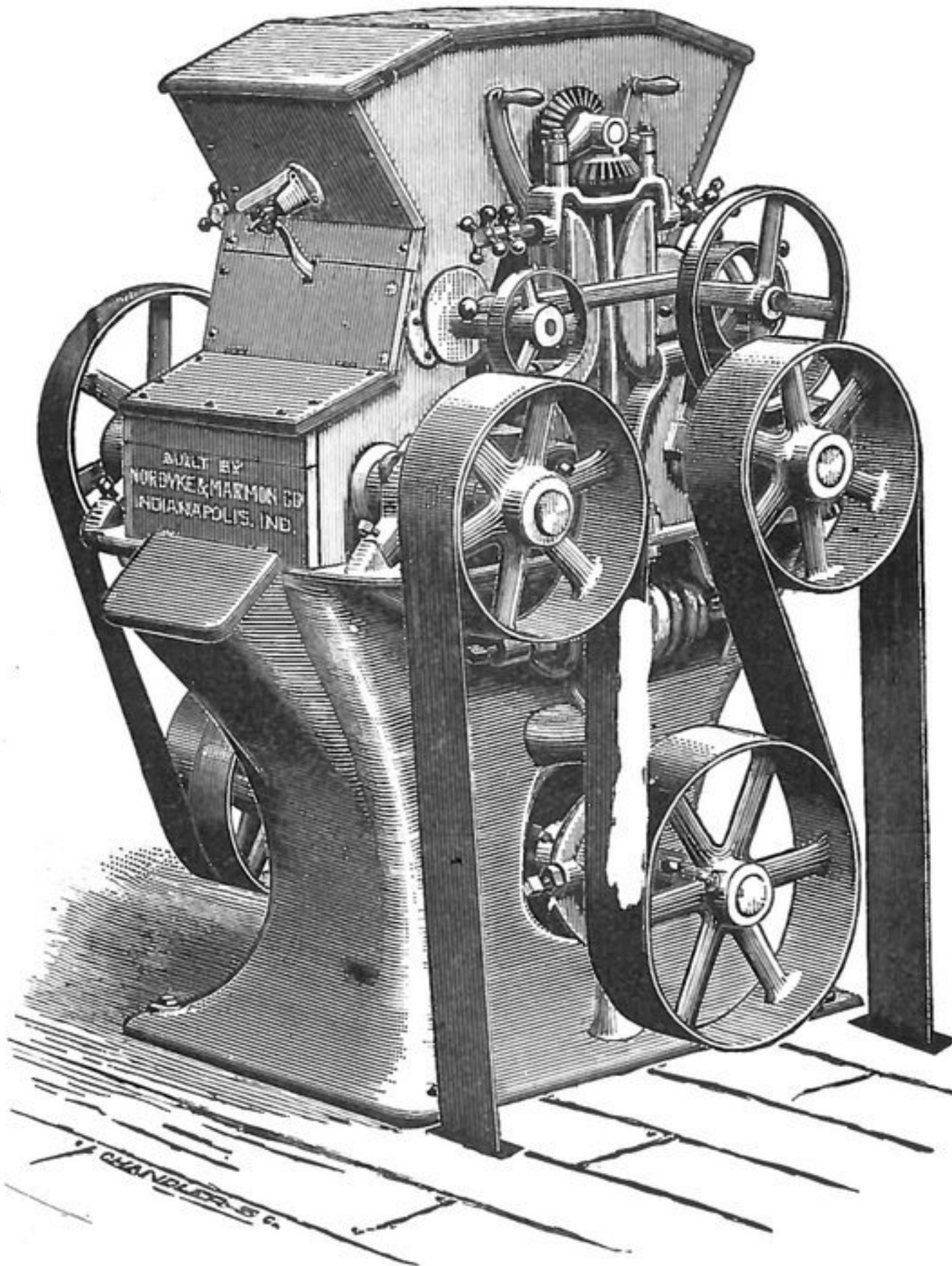


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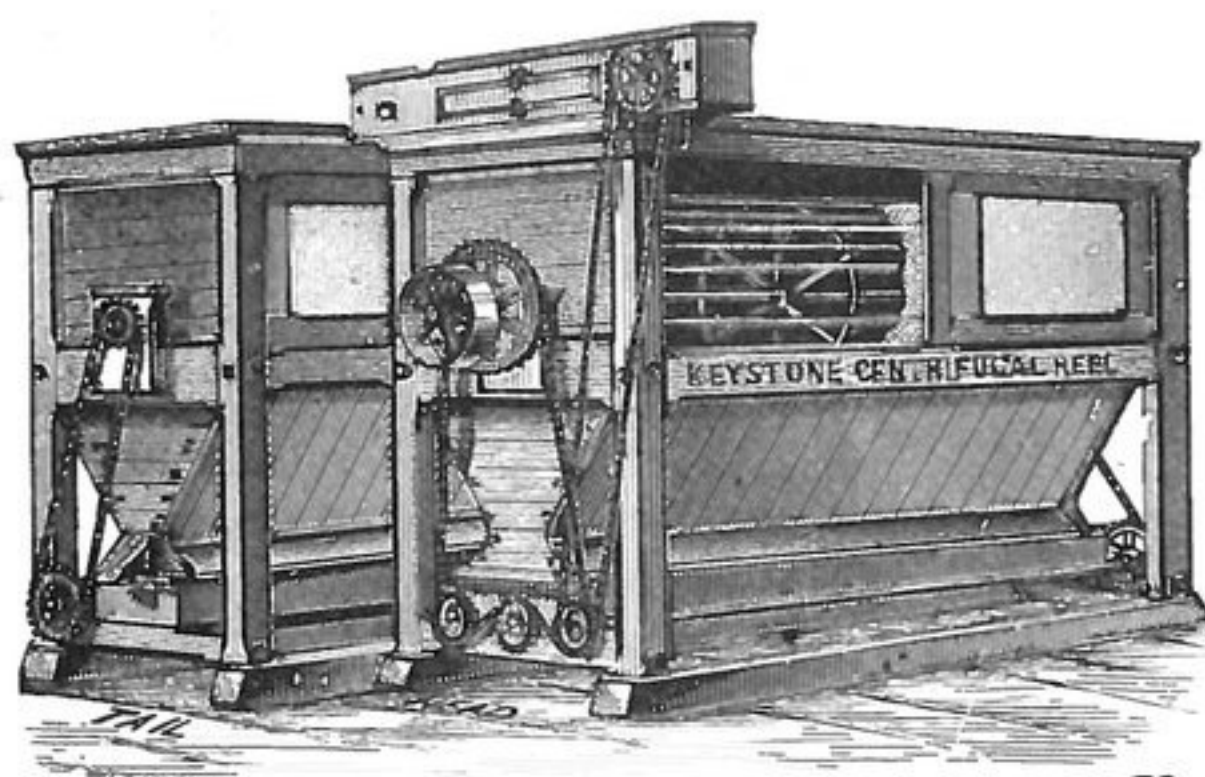
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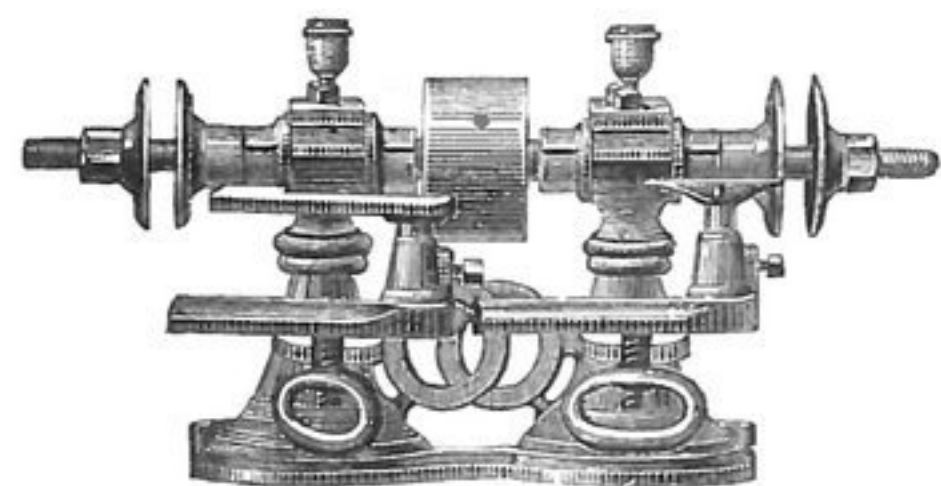
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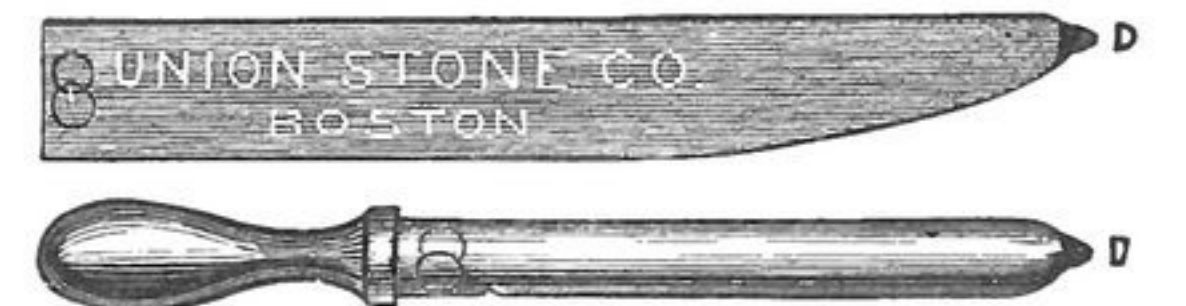
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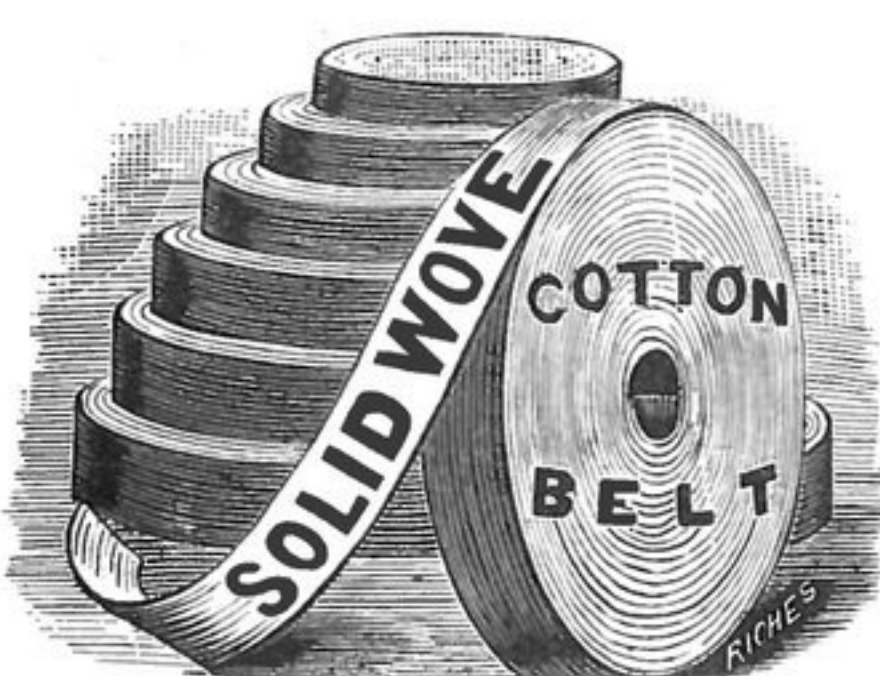
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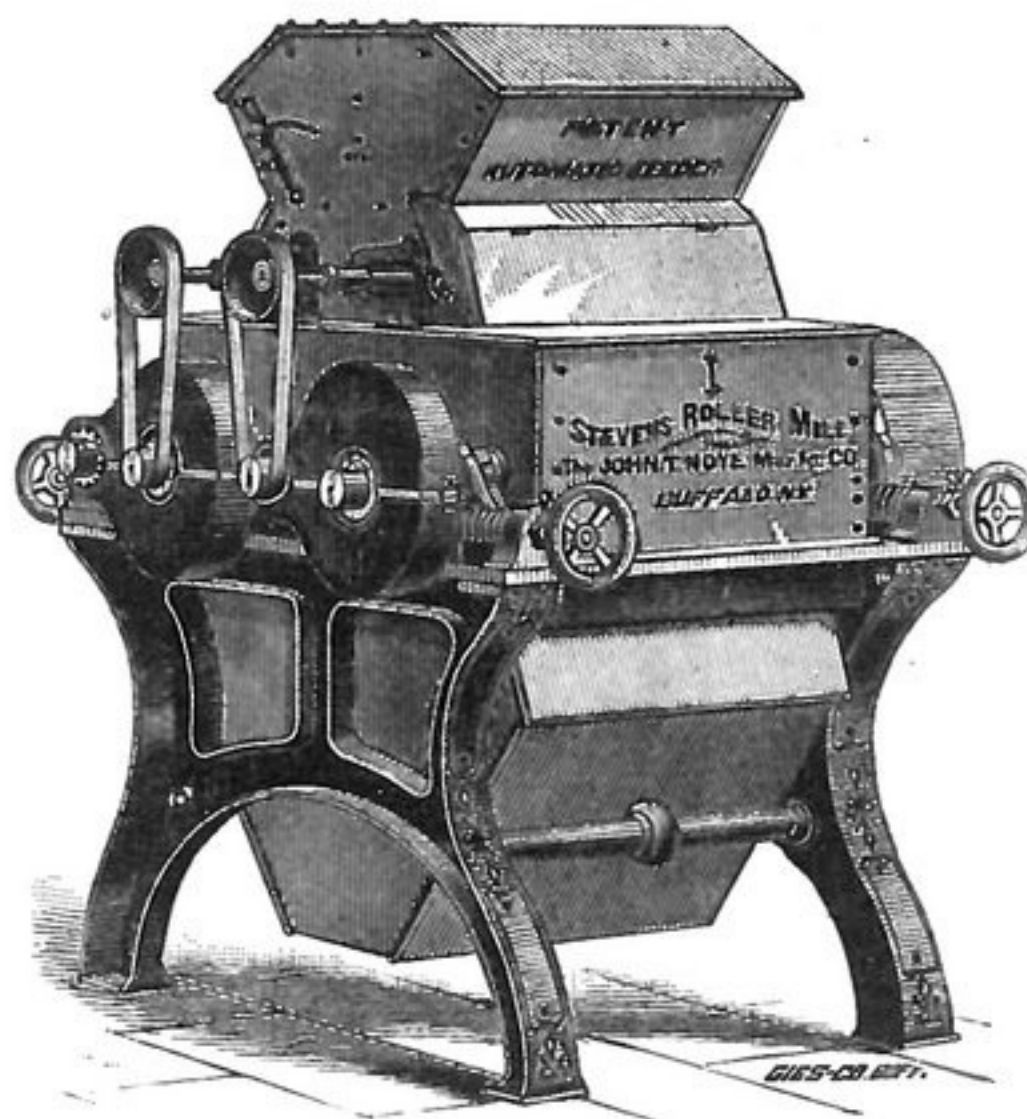
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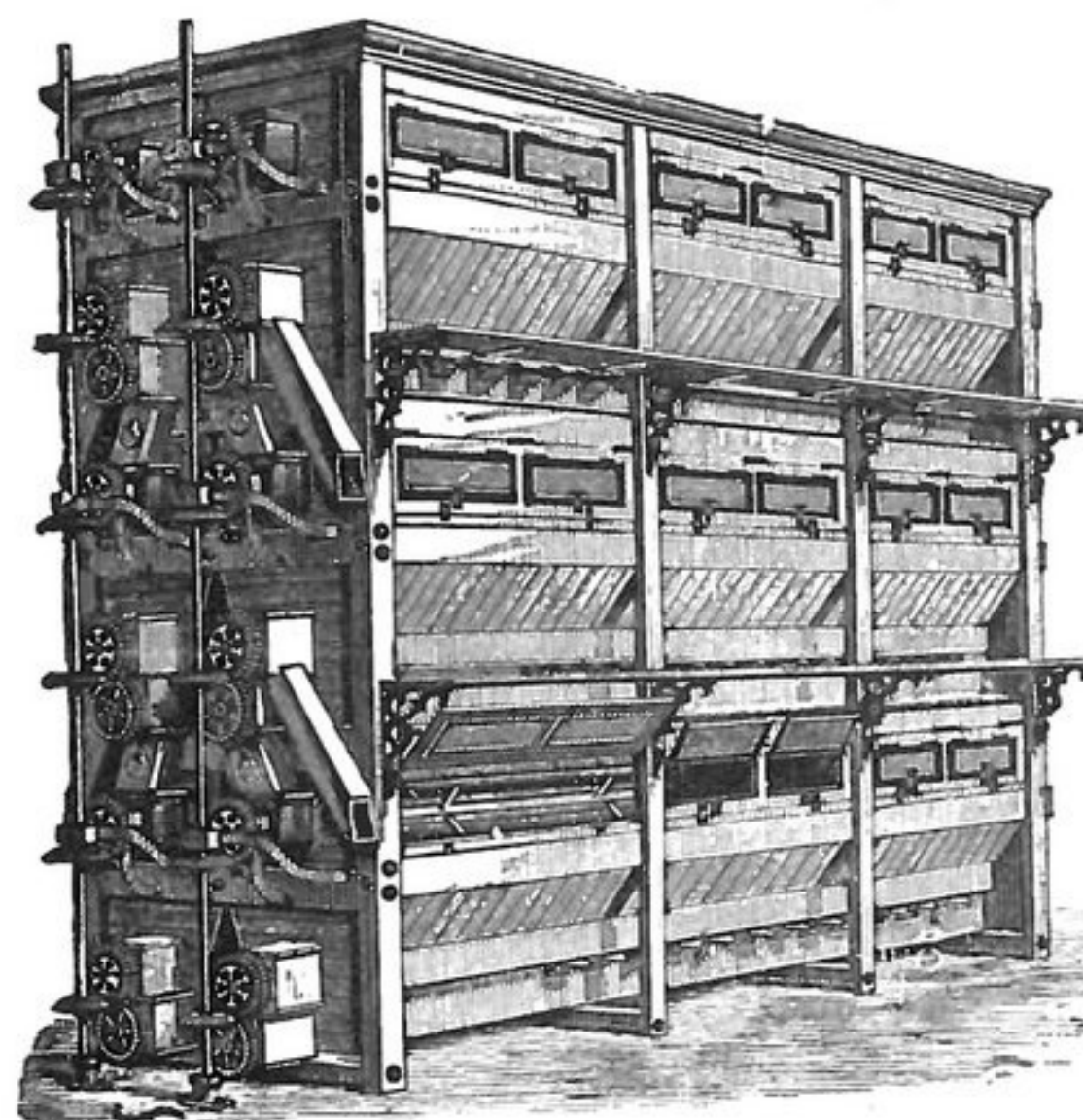
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